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Editorial Notes

AT the end of the year it is natural to look back and take stock. What have archaeologists achieved in 1949 and how far has ANTIQUITY succeeded in reflecting those achievements? The two most important events of the year were the publication of a discovery made last year in Palestine, of a cache of Hebrew scrolls of the Old Testament, and the invention of a new technique by means of which ancient fragments of wood and other organic substances can be dated in terms of years. We gave our readers the essential facts about the Hebrew scrolls long ago (September, 1948, pp. 159-60), some time before their importance was generally recognized; and we did the same for the radiocarbon method in our last number. We hope to publish more about both. As so often happens, neither discovery was made by archaeologists; the scrolls were an accidental find, and the radiocarbon method was discovered by physicists. The importance of both lies in the realm of technique rather than in any new historical knowledge revealed. That is obvious for radiocarbon; for the other it seems that the chief contributions will be linguistic and palaeographic—of immense value and far-reaching importance but primarily technical.



The exact date of the scrolls is not yet finally determined. They were stored in pottery jars with saucer-like covers of a Hellenistic type already known and dated a century or thereabouts B.C. As Mr Lethbridge pointed out in a letter to the *Times*, it is absurd to suppose that antique jars, complete with their antique covers to the number (originally) of 30 or 40, would have been used; and the date when the cache was made must therefore be that assigned to the jars—and this is a purely archaeological affair. The jars date the texts.



There are evident signs that British archaeology has got into its post-war stride. The dry summer has been welcomed by air-photographers and excavators. Dr St. Joseph has made some more remarkable discoveries, this time in s.w. Scotland, and we shall look forward to the annual exhibition, organized by Kodak Ltd., with more than usual interest. (Why not have one in the winter?) In this connexion we would suggest that an exhibition of British archaeological air-photographs should form part of the Festival of Britain in 1951. This is a line we started in this country and have made our own, though the French, led by the Rev. Father Poidebard and now also by M. Baradez are now becoming close competitors in Syria and North Africa. (When will they begin

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work at home? France offers a fine and virgin field). Drought has also helped Dr Grahame Clark in his excavation of the first inhabited mesolithic site (if we except his mesolithic camping-ground near Farnham, Surrey) to be discovered and scientifically excavated in this country (see pp. 207-8 of this number). Professor Stuart Piggott has excavated a chambered Long Cairn (Cairn Holy in Kirkcudbrightshire), and found a partly intact burial-chamber. One of the finds was part of one of those greenstone ('jadeite') axes with a highly polished glassy surface which are usually thought to originate in Brittany. Thus they can at last be safely dated, and the already long-suspected migration northwards along the Atlantic seaboard is confirmed in a striking manner. Excavations have continued on the sites of Saxon towns at Thetford and Southampton, and of Roman London and Canterbury; a Roman villa at Lullingstone has produced a very fine pavement and statuary. An ancient homestead site at Mynydd Bychan in Glamorganshire has been excavated. In Ireland, Professor Bersu has proved, by excavation, that hill-forts do exist there, and has found evidence of extensive iron-working in his hill-fort near Kilkenny. (The list is of course incomplete and we apologize for the omissions).



Many of these excavations have been carried out by voluntary student labour. The first-hand experience thus gained must necessarily be valuable; even more so perhaps will be that of those taking part in organized courses. There have been at least two such; one, conducted by Professor Wheeler at Verulamium, and the other by Professor Piggott at Salisbury. The latter was organized by the British Council, whose new enterprise is warmly to be commended. It was designed for advanced students and included archaeologists of known standing and achievements. As was only to be expected, the course followed in the footsteps of General Pitt-Rivers, and aimed at displaying not only the field-works (to coin a phrase from 'field-archaeology') which have survived better here than abroad (hill-forts, Celtic fields, etc.) but also the history of the subject, its organization (by State, Universities and Societies) and techniques (air-photography, excavation, field-work, electrical sub-soil survey). The Archaeology Officer of the Ordnance Survey (Mr C. W. Phillips) gave a lecture on 'Archaeology and the Ordnance Survey'. The success of the course would amply justify its repetition in 1951. May we suggest that representatives of archaeology in the Americas should be specially invited to take part? They would be sure of a hearty welcome from their British colleagues.





Another outstanding feature of the year has been the meetings of the Prehistoric Society. A three days' conference was held at the Institute of Archaeology in the spring and another at Exeter in the autumn. Both were in delightful surroundings, very different from the stuffy atmosphere of Burlington House, and there was 'a vehement spirit of research in the air'. The first meeting was devoted to prehistoric houses, a subject which the President, Sir Lindsay Scott, has made his own. It was an excellent idea to have such a single subject instead of a set of disconnected addresses; it gave coherence to the discussions which were spread over the meeting, and incidentally saved valuable time, because it was thus possible to concentrate into a single discussion the remarks about two or more addresses. The general level of discussion was a high one, controversial points were dealt with in a manner befitting a scientific society; and when it was all over we all felt that we had not only had a good time but also an edifying one.

EDITORIAL NOTES



In this, the last number of the year, we have to remind our readers that their subscriptions for 1950 are due, and that prompt payment is a very great help. Forms of payment for 1950 are inserted in the copies of all who do not pay by Banker's Order. May we urge those who do not do so already to *pay their subscription in future by Banker's Order*, a form for which is included in the present number? This saves a great deal of work at our end, and will also save them some. It of course involves no obligation beyond the current year. May we also suggest that *ANTIQUITY* for 1950 would be a very good Xmas present? Many readers have in the past thought this a good idea; the beneficiaries have generally agreed to become subscribers for the following years. The form makes provision for this also.

Will our American readers please note that devaluation has reduced their subscriptions to 3 dollars? And may we suggest that they might spend the balance, which is nearly one half, on a Xmas present? We shall, of course, give the same, or better, value for it.

We would also ask indulgence of those readers who may receive publicity leaflets during 1950. We plan to send out a large number, and although the Editor tries to eliminate known subscribers, he cannot carry in his head the names of all; and mechanical collation is costly and impracticable. If you do receive such there is a very simple remedy—send it on to a friend! The results of our 1949 campaign were very satisfactory—so much so in fact that we had to stop prematurely because we ran out of stock. On the strength of it we have been able to add an extra eight pages; this is only a beginning. If all goes well we shall be able gradually to recover our former size and abundance of illustrations. No one can do more to help achieve this than those readers who get others to subscribe; one such all round (as a Xmas present?) and we should reach the goal at one bound. We are determined to get back somehow to our former size, if possible by increasing our circulation and not your subscription, which—be it noted—is the same as in 1927 when we began.



It is because we are so terribly cramped for space that the Review section has shrunk so much recently. Actually in the present number we have expanded it considerably, but we need two or three times as much space to publish what we already have, let alone reviews of the new books that are constantly arriving. This is a problem common to all periodical publications nowadays. We apologize yet once more to all concerned for the delay, or even failure to review at all; lack of space is wholly and solely to blame. The new section listing Important New Books and Articles is an attempt to mitigate the situation. Again an increased circulation is the only remedy. But we do not wish to end the year with a moan! We have complete confidence in the future, and of our ability to provide our readers with good fare.



As we go to press we have received a very interesting letter, announcing the first archaeological date provided by the radiocarbon method. As there is no room for it on this page we have printed it on p. 229, at the end of the Review Section. Readers in America will be particularly interested.

Moas and Man

(PART I)

by R. S. DUFF

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WHEN we remember that the Maoris volunteered no traditional information about the extinct moa (*Dinornis*) until Europeans had unearthed its bones, said nothing about the Chatham Islands until after their discovery by Europeans, only recalled dim memories of inhabitants before the Fleet of A.D. 1350 in response to persistent questioning by Europeans, and could not tell us whether Hawaiki (1) was Tahiti or Samoa, we realize the always supine rôle of Maori tradition in aiding the researches of the culture historian.

However the sheer mass and variety of these orally transmitted traditions prevented the student from realizing how irrelevant they were to his theme, and caused him to believe that the Maori purpose in transmitting traditions was like his—to satisfy an essentially academic curiosity about the past. The gradual cessation of the output of published traditions has given students the leisure to realize the limitations of those already recorded, and sobered us against the expectation that a Maori tradition current in the 19th century might include a description of a bird which lived perhaps in the 13th, or go into detail over the appearance and habits of the tribes whom his Fleet ancestors dispossessed in the 14th.

Fortunately the need for the family to maintain its status within the clan, the clan within the tribe, and the tribe as against other tribes, did involve the careful transmission of family trees (Whakapapa). By comparing the number of generations in many lines back to a Fleet ancestor, the arrival of the Fleet was placed in the mid-14th century. By a brilliant application of the method beyond New Zealand, Percy Smith found a three generation name sequence immediately prior to the Fleet arrival common to Hawaii, the Society Islands, the Cook Islands and New Zealand. This established with reasonable certainty that the movement which brought the canoes of the Fleet to New Zealand originated in the Society Islands and simultaneously sent migrants to the Hawaiian and Cook groups. Traditions in New Zealand recorded with a significant unanimity the names of the canoes of the Fleet migration, their landing places, and the tribes which sprang from each. They noted the introduction by the immigrants of the sweet potato (*kumara*), the taro (*Colocasia antiquorum*), the gourd (*Lagenaria*), and the yam (*uwahi*), both by means of references to incidents of the voyage or by accounts of subsequent return trips to Hawaiki to fetch these plants.

Beyond this era little information was volunteered in tradition until the need to establish court claims to land brought belated mention of family trees going back to an

¹ By Hawaiki is meant the Society (and in transit the Cook) Group which were reasonably established by comparative genealogies as the immediate origin of the Maori Fleet, Toi and Kupe. Traditional evidence had eliminated the claims of the Samoan Group in Western Polynesia.

earlier Hawaiki immigrant, Toi, whose arrival was placed about two centuries prior to the Fleet, *circa* A.D. 1150. Christened the 'first born' (Toi-te-huatahi) in Hawaiki, Toi was remembered through the Fleet traditions of 1350 as the man 'who lived on wild [lit. tree] foods' (Toi-kai-rakau), a significant reference to the failure of his migration to introduce crops.

Beyond Toi, there are no reliable family-trees, and only confused and conflicting references to the existence and place of origin of prior inhabitants. Regarding the pre-Toi inhabitants one plausible, circumstantial and widely publicized account (S. Percy Smith, 1915) has been unfortunately taken as indicating a non-Polynesian migration which students have eagerly invoked in explaining any and every point of difference between the culture of the Maoris of the late 18th century and their Polynesian relatives.

Finally, as there must be a discoverer belonging to the Hawaiki stock to which the Fleet ancestors belonged, New Zealand's discoverer was alleged to be Kupe, *circa* A.D. 950. We are told, improbably, that after discovering New Zealand and exploring its coasts, Kupe returned to Hawaiki and left no settlers. However Kupe's sailing directions were handed down in Hawaiki and proved precise enough to enable Toi, two hundred years later, and the Fleet, four hundred years later, to sail into the blue, reach and settle New Zealand.

Summing up the traditional evidence, the sequence of events is as follows :—

The Hawaiki Polynesian, Kupe, discovers New Zealand, but returns and leaves no settlers ; A.D. 950.

A non-Polynesian migration (Maruiwi or Mouriri), coming from the northwest, settles the North Island ; date uncertain, but post-Kupe.

The Hawaiki Polynesian, Toi, rediscovers and settles New Zealand ; A.D. 1150.

The arrival of the Hawaiki Fleet brings to a close a general period of migration from Polynesia. Introducing the sweet potato and other food-plants, the newcomers impose themselves as an aristocracy upon the Toi and pre-Toi descendants, and found the tribes which were dominant in Cook's time ; A.D. 1350.

After the Fleet arrival, intercourse with Polynesia ceased, and New Zealand's isolation was not disturbed until the arrival of Tasman 1642 (not remembered in Maori tradition) and Cook (1769).

This sketchy framework of Maori origins is unlikely to receive any new elements from tradition, and the first task of archaeology is to endeavour to answer some of the questions regarding the pre-Fleet settlement which are left unsettled.

These are :—

- (1) Whether the human settlement of New Zealand is likely to be earlier or later than the traditional date of A.D. 950.
- (2) Whether any non-Polynesian migration has reached New Zealand.
- (3) Whether the presence of moa remains in middens fixes the deposit as a pre-Fleet culture stratum.

Dealing with the last first, the presence of bones of the moa, and, as we now know, other extinct birds, in human middens provides for the New Zealand archaeologist an obvious indication that the site is old. How old archaeology in itself cannot tell, because within a time framework of one thousand years or so an occupation layer of the first two centuries need look no older nor be bedded deeper than one dating from the two centuries immediately preceding European settlement. The depth of deposit bearing soil is normally less than three feet, while stratification virtually does not exist.

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SIGNIFICANCE OF PRESENCE OF MOA BONES IN HUMAN DEPOSITS

The first fact to establish was indeed the basic one, whether the moa was contemporary with man, when, in a country widely endowed with surface deposits of sub-fossil moa-bones, the evidence comprised finding moa-bones and human ovens in conjunction. To this, geological doubts as to the survival of the moa beyond the post-glacial period and the extraordinary vagueness of Maori traditions, contributed.

The first discovery of quantities of moa bones in human middens was made at Waingongoro, on the south-west coast of the North Island, as early as 1843, while four years later, at Awamoa, Mantell made the first of numerous discoveries from the east coast of the South Island. However, as Colenso noted as early as 1841 (Colenso, 1843) that the Maoris in the East Cape district of the North Island were in the habit of collecting sub-fossil moa-bones for manufacture into fish-hooks, the presence of moa bones in a midden could not of itself be taken as proof of the killing and eating of the birds. The presence of stout limb-bones in sites where there is no traditional possibility of the bird having been a contemporary is now widely established, while Steele's experiments have proved sub-fossil bone to be sound enough for all the uses to which recent Maoris could have put it.

Even the discovery at Kaikoura in 1859 of a moa egg in an apparently Maori grave did not settle the issue beyond doubt. Many of those who opposed the views of Julius von Haast (1872) that the moa could only have been a contemporary of an ancient 'autochthonous' palaeolithic man in New Zealand shared his opinion on the egg when he 'could not conclude therefrom that the . . . egg was of co-temporaneous origin with the individual with whom it was buried . . .'. Evidence of the now well-established custom of perforating the eggs from one end only, was not recorded, and now that the egg is in the possession of a collector at Anglesey, ANTIQUITY might be able to render a service to New Zealand archaeology by publishing photographs of this long-elusive exhibit (2).

This doubt persisted through the subsequently discovered sites (which were all at other points dotted along the east coast of the South Island) until the discovery in 1939 of the now famous site at the mouth of the Wairau river. The recovery from the Wairau graves of no fewer than ten moa eggs, of which the few sufficiently intact to reveal it had been blown by means of a perforation at one end, finally established beyond doubt that the moa and man were contemporary, and that the moa remains in these camps were true midden deposits.

Furthermore, by revealing a material culture demonstrably distinct from recent Maori culture, the Wairau excavations greatly strengthened the hypothesis, already justified by the negative evidence of the absence of traditions, that the moa was exterminated in pre-Fleet times. As stated earlier the absence of sufficient references to the moa in recent Maori traditions is not in itself sufficient to justify the inference that the bird had been exterminated by pre-Fleet tribes. Taken in conjunction with the recovery of a quite distinct material culture from the largest Moa-hunter camp yet excavated, the absence of traditional evidence becomes much more significant.

Until sites where moas were killed and eaten reveal artifacts of recent Maori type it is justifiable as a working hypothesis to assume that the presence of bones of Moas and other extinct birds fixes the deposit as a pre-Fleet stratum. For the North Island this hypothesis might be categorically applied as indicating a pre-Fleet stratum in point of time. For the South Island, more remote from the reach of new migrations from

² Our efforts to secure this were unsuccessful.

Polynesia, and in its dry eastern grasslands more thickly populated with moas, the possibility of moas and Moa-hunters overlapping the Fleet arrival until the late fourteen hundreds must be taken into account. While there is in fact no traditional justification for a later survival of moas in the South, I feel justified by caution in fixing the year 1500 as the effective termination of the Moa-hunter era in the South and the Fleet arrival of 1350 as its certain termination in the North.

Field workers must still of course exercise sufficient care to establish that the association of bones and middens is primary, that it is not for instance the result of a common type of wind erosion in coastal sand-dunes by which oven stones and implements finally come to rest on pre-human moa remains, nor confined only to stout and durable limb-bones imported for fashioning into implements.

Up to now most Moa-hunter camps and all important Moa-hunter finds have been made in the South Island; the North Island can only establish a probable contemporaneity of moa and human remains at Opito in the Coromandel Peninsula and at Porirua and Waingongoro on the south west coast, overlooking Cook Strait and the South Island.

For this contrast the originating cause was the greater suitability of the extensive grassland zone on the east coast of the South Island as a habitat for the most common (if not the only) moa which survived into human times. This was *Euryapteryx gravis*—a massive but comparatively short-bodied genus standing between five and six feet high. But the scarcity of North Island records is also attributable to other factors, including its readiness of access to all arrivals from Polynesia and the probability that the first tribes were swiftly succeeded by others, and, no less important, the continued presence there today of a large Maori population hostile to archaeological projects. Apart from the larger moa population there, the South Island represented a remote or marginal area in which the first settlers remained in much greater isolation and survived long enough to have left large and easily identifiable occupation sites.

If this thesis is valid, New Zealand is unique in Polynesia in that the beginning of the process of local culture development can be fixed by the objective evidence of the presence of moa bones and compared on one hand with the first local development of Maori culture, while providing on the other the most direct evidence yet on the prototype Polynesian culture of the Eastern Polynesian Hawaiki.

BEARING ON DATE OF DISCOVERY OF NEW ZEALAND

I return now to the first question which tradition leaves open, whether the discovery of New Zealand is likely to be older or later than the accepted date of A.D. 950.

The starting point for the discussion is the demonstration that moa remains, which in some South Island sites cover as many as 150 acres, were wholly from birds killed by man. At Wairau it is not possible to dig anywhere over an area of 15 to 20 acres without striking bones; at Rakaia, Haast found them scattered over 50 acres, while, at Waitaki, Teviotdale records an area of 150 acres. While on the last two sites the bones were scattered rather than heavily concentrated, at the much smaller Shag River site (an area less than 300 by 70 yards) the bones were so numerous that, as Skinner records 'The next investigator . . . dug up Moa bones, conveyed them on a punt constructed for the purpose, up the Shag river to the railway, and filled several railway trucks with them. These were dispatched to Dunedin bone-mills . . .'

If these river-mouth deposits represent a fair sampling of the moa population then distributed over the whole eastern face of the South Island, the birds must have been

virtually as numerous and widespread as the domestic stock of today. Assuming also that the traditional evidence correctly assigns their extermination to the pre-Fleet period, this would imply a human occupation commencing much earlier than the four centuries traditionally allowed, from Kupe's discovery in 950 to the Fleet arrival of 1350. However I suspect that the river-mouth deposits in some way represent an abnormal concentration, their significance being due either to the preference of the surviving genus (or genera) for an estuarine habitat, or to the use of water transport by the Moa-hunters to bring them downstream from inland haunts. Regarding the range of genera which survived into the human period, R. A. Falla (1942) concludes on good evidence that only one (*Euryapteryx gravis*, 'the quarry *par excellence* of the ancient moa-hunter') survived in large numbers, while there were occasional remains of *Emeus huttoni* and some evidence for *Pachyornis*. This dwindling of the moas to virtually one genus would in my opinion support the presumption that this genus (*Euryapteryx*) was not evenly distributed but concentrated in certain favoured localities; but even granting this hypothesis it obviously survived in enormous numbers in these favoured spots.

Perhaps even more significant than the moa evidence, is the demonstration from middens at Wairau and at Sumner that the Moa-hunters exterminated a swan (*Chenopsis sumnerensis*) whose existence is completely forgotten in Maori tradition. From the Chatham Islands where the same bird had also been exterminated, the extermination was recent enough for the name (Poua) to survive, also a detailed memory of a method of taking the moulting birds by driving them over the lagoons into V-shaped corrals of brush-wood; but the Morioris had retained no clear notion of the appearance of the bird itself, so that until he found its bones in 1892 H. O. Forbes (1893) was eagerly expecting a new genus of *Dinornis* or *Apteryx*. Assuming *Chenopsis sumnerensis* was as well adapted to estuarine conditions as its recently introduced Australian relative (*Chenopsis atrata*), one must agree with Forbes that the 'cause of the total extinction . . . of the ancient swan . . . in its natural home appears at present inexplicable'.

The extinct eagle (*Harpagornis*) whose bones, worked into awls, survived at Wairau and Sumner to remind us of this third fabulous contemporary of man, occupies in Maori tradition a position almost as shadowy as the swan, little more than the names (Hokioi and Poua-Kai) being remembered. In the latter we may recognize, in the light of the Moriori traditions, a translation of the Swan.

Archaeology has then demonstrated the extermination by man of three bird species, of which the largest and most spectacular (the moa) was not sufficiently remembered in tradition, and what appears to have been the most numerous (the swan) was not remembered at all; while traditions of the eagle are so fabulous that they may in fact be distorted memories of either the moa or swan. The most convincing explanation of the absence of tradition is that the extermination was effected by the predecessors of the Fleet immigrants, and the material culture of Moa-hunter camps supports this assumption. Accepting 1350 as the date of the Fleet arrival, are the four centuries allowed beyond that date to the quite hypothetical discoverer Kupe sufficient for the extermination of three species of birds of which the moa and swan must have existed in vast numbers, with the latter and the eagle presumably difficult to capture? We can regard it as certain that the pre-Fleet tribes did not possess the bow, or any missile hunting weapon.

Summing up his review of the bird remains in Moa-hunter camps, R. A. Falla emphasizes the possibility that the date of human discovery should be pushed back to allow the early migrants sufficient time to have exterminated the moa, the swan, the eagle and other extinct birds. 'The traditional dates between A.D. 900 and 1150', he writes, 'are currently accepted as correct for the first Polynesian immigrants. This

leaves only two or three hundred years, or at most five hundred in the South Island, for a marked change not only in the personnel and culture of the human inhabitants, but also in the composition of the avifauna. Either the arrival of the first human immigrants must be regarded as having taken place more than a thousand years ago, or we must conclude that the end of the era of the moa, the eagle, the crow and the swan in New Zealand has occurred somewhat abruptly within the last thousand years'.

The final solution here is likely to be provided by Zoology. Archaeology has however supplied the evidence for the present zoological formulation of the problem, which represents an immense advance on the subjective basis of previous speculations, and should in time provide the additional decisive evidence.

In the meantime there is strong circumstantial evidence for believing that human settlement must be earlier rather than later than A.D. 950, while it might be categorically stated that Toi's migration (1150) cannot represent the first occupation of New Zealand.

THE PROBLEM OF A NON-POLYNESIAN MIGRATION

In the light of archaeological investigation, particularly of the Wairau site, to which this essay serves as an introduction, the possibility of any non-Polynesian migration reaching and establishing itself in New Zealand is seen as improbable.

It should be emphasized that traditional support for such a migration dates only from the present century, when in 1913 the Polynesian Society published the second of two volumes of a Maori manuscript allegedly written down in the eighteen sixties. The origin and authenticity of these traditions have been severely criticized by Williams (1937), while no one has established from the somatology of the Maoris of today, or from skeletal and archaeological remains, any greater incidence of Melanesian characteristics than in other parts of Polynesia.

Regarding this improbable hypothesis of a Melanesian migration, it is certain that it has not arrived since the Fleet, nor would even the most partisan Maori tradition allow it to follow any Polynesian settlement, so that its effects should be stronger the earlier we go back. To establish that the earliest demonstrable phase of New Zealand culture differs from the recent phase, not in the existence of Melanesian affinities but in the more obvious incidence of Eastern Polynesian characters, causes us to look first to local development to explain features of recent Maori culture which do not readily accord with an Eastern Polynesian origin.

For want of a better term I propose to revive Haast's original term Moa-hunters to describe those settlers who began and probably completed the extermination of the important group of avifauna described, in the certainty that some of their camps must be of pre-Fleet date and in the possibility that all may so be. The evidence is largely from the east coast of the South Island, but as many of the distinctive artifacts have been found in the extreme north of the North Island and most in the Chathams, the presumption that this is New Zealand's oldest, and originally a widespread, culture is strong.

The idea that the Moa-hunters were in physical type and culture quite different from the Maoris dates from Haast's letter to the Zoological Society in 1870 on the Rakaia camp. Haast's original Moa-hunters were earth-born ('autochthones'), living at a remote period when a land bridge joined the two islands of New Zealand and, like the ancient hunters of Europe, whose existence had been recently demonstrated by Boucher de Perthes, palaeolithic. Haast finally agreed that he was mistaken on this last point, but he did not cease to regard the Moa-hunters as preceding the Maoris by thousands rather than hundreds of years. The next 'red herring' to be drawn across the

Moa-hunters' trail was the view, largely disseminated by S. Percy Smith (1915) and Elsdon Best (1916), on the basis of the suspect Maruiwi tradition already referred to, that the earliest inhabitants of New Zealand were an inferior Melanesian migration from Fiji or the islands westward, who were conquered by the superior Polynesian immigrants of the Hawaiki Fleet of A.D. 1350. These views, the first over-emphasizing the remoteness from the Maoris of the period and type of the Moa-hunters, and the second mainly a fabrication, had their expected reaction in an over-emphasis of the identity of Moa-hunters and Maoris.

The main emphasis for instance in New Zealand's first sustained and competent archaeological project, the careful excavation of South Island coastal sites from the Waitaki river to the Tahakopa river, was the negative one of rejecting any evidence of a non-Polynesian migration (Teviotdale, 1933). Inspired and directed by Cambridge-trained H. D. Skinner, lecturer in ethnology at Otago University College, David Teviotdale excavated at Shag River (1915 onwards), Tahakopa (1937-8), and Waitaki (1939), while Skinner reviewed the earlier finds at Moa-bone Point Cave, and Monck's Cave, Sumner. Unfortunately these admirably conducted and accurately recorded excavations disclosed no burial finds, stratification could not be established, and the artifacts found were not distinctive enough to warrant any but the negative conclusion that the material culture of the Otago-Southland Moa-hunter Maoris was not Melanesian, with the further implication that it differed in no way from that of the tribes of the late 18th century.

The wealth of grave offerings from the twenty-nine burials found at the Wairau site (1939 onwards) has resolved this riddle of likeness versus difference by revealing a material culture sufficiently like 18th century Maori culture to be regarded as the production of a people essentially similar to the Fleet Maoris, but different enough to be regarded as ancestral and originating in pre-Fleet times (Duff, 1942). I should say more properly that this is my interpretation of the evidence. Putting this hypothesis in another way; the material culture of the Maoris as Cook found them differed so strongly from that of the nearest islands on any possible migration route from Polynesia that it is difficult at times to see any connexion. From an isolation of at least five centuries in a new and unique environment, Maori culture had diverged sharply, sometimes almost unrecognizably, from its Polynesian prototype. The Maori collections in museums normally represent the end product of this divergence.

The Wairau culture on the other hand may be taken to represent a stage when the divergence of New Zealand material culture from the presumed Hawaiki culture was not so great that its Eastern Polynesian affiliations cannot be recognized, while sharing enough common features with recent Maori culture to be regarded as a stage in the evolution of the latter.

The trend of archaeological researches to date thus renders the hypothesis of a non-Polynesian migration increasingly more difficult to sustain, without quite quashing it.

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The Open Field in Devonshire

by H. P. R. FINBERG

IT has been generally agreed that Devonshire lies outside the area formerly cultivated under the open-field system. The map which serves as frontispiece to Gray's monograph on the subject shows the western boundary of the open-field area beginning in west Dorsetshire and passing up northward across Somerset so as to exclude Devon, Cornwall, and west Somerset (1). Dr and Mrs Orwin, while revising and correcting Gray's data at several points, are emphatic where the south-western counties are concerned. 'In *Lancashire, Devon, and Cornwall*, there is nothing to indicate that the system [of open fields] was ever followed (2)'. Recent text-books naturally follow in the wake of these authorities. Professor Darby, for example, writes that in Cornwall, and by implication in Devon also, the prevailing type of rural economy 'had no relation to the three-field system'; and he illustrates his remarks with a reproduction of Gray's map (3).

One well-known fact, which at first sight appears irreconcilable with these pronouncements, was not overlooked by the authors. I refer to the existence at Branton, in north-west Devon, of an open field of some 350 acres, divided into nearly five hundred arable strips of intermixed ownership. 'Some persons own very many of the strips scattered all over the field; that is to say, several strips in almost every division of it. Others have a few only, one here and there. But in all cases the strips of one owner are everywhere separated from each other by interposed strips of other owners . . . The line of demarcation between any two strips is commonly indicated by a narrow unploughed balk . . . The lesser plots appear as a rule to approximate in area to half an acre, more or less, and the others to multiples of this quantity . . . Very few exceed the limit of two acres' (4).

Concerning this field Gray propounds a theory which seems designed to explain it away. According to him, 'Its position on the map and its low-lying character suggest that it is land at some time reclaimed from the marshes; the two other manors in Branton not adjacent to the marshes have no open field . . . The extensive scattering of the strips may have been due to the gradual reclamation of the area, each furlong having been subdivided by lord and freeholders as it was improved . . . If these conjectures be correct, Branton Great Field was of relatively recent origin' (5). The Orwins accept this conclusion, and add some conjectures of their own. 'The Great Field is probably a reclamation, comparatively recent, from the river estuary, rather than a survival of ancient cultivation. The tenants occupy their holdings in it in conjunction with enclosed fields on the higher land adjacent, and probably the Great Field was once common grazing, which was allotted in blocks to those who had grazing rights in it

¹ Gray, *English Field Systems*, 1915, frontispiece and p. 63.

² Orwin, *The Open Fields*, 1938, p. 61.

³ *An Historical Geography of England before A.D. 1800*, ed. Darby, 1948, pp. 194, 207.

⁴ Phear, 'Notes on Branton Great Field' (*Transactions of the Devonshire Association*, xxi, 1889, p. 202). Venn, *The Foundations of Agricultural Economics*, 1923, p. 14, gives an excellent though brief account of the Field, illustrated by two photographs in which the grass balks are plainly visible (plate ix).

⁵ Gray, *op. cit.*, pp. 262, 263.

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when the silting of the estuary had reached a level at which the grazing of this rich soil could give place to cultivation' (6).

In the course of this paper it will appear that open fields were at one time by no means rare in Devonshire. But before examining the data from other parts of the county, it will be advisable to clear up once for all the doubts which have been expressed concerning Branton Great Field. The evidence has been accessible in print for the last fifty years, and is incontrovertible. An entry in the Calendar of Close Rolls shows that on the 20th of March, 1324, the escheator of Devon made an assignment of dower to Eleanor, widow of Ralph de Gorges, lord of the manor of Branton Gorges. The widow received, *inter alia*, 26½ acres of the demesne arable, made up as follows :

1 a.	in the <i>cultura</i>	Underfayrlinch, in two parcels ;
1 a.	„	„ at Schorteland ;
1 a.	„	„ at Le Aliene ;
2 a.	„	„ of Myddelforlong, in two parcels ;
3 a.	in four parcels	on La Merlane [<i>sic</i> ; cf. next item] ;
3 a.	„	„ in the <i>cultura</i> under La Morlane ;
1 a.	in the <i>cultura</i>	Bysoutheye ;
1 a.	„	„ Bywestegreneweye ;
1 a.	„	„ Byestegreneweye ;
1 a.	„	„ Bywestestriclane ;
2 a.	the most southern	in the <i>cultura</i> at La Putte ;
2 a.	in the <i>cultura</i>	Byestecharthurn [<i>sic</i> ; cf. next item] ;
2 a.	„	„ Bywestelathurn ;
1 a.	„	„ at La Crofta ;
1 a.	„	„ on Smerham ;
½ a.	„	„ at La Longeland ;
1 a.	„	„ Byestesmaleweye ;
1 a.	„	„ at La Cok ;
1 a.	„	„ called Stonacre ;
<hr/>		
26½ a.	(7)	

Here is documentary proof that dispersed arable strips were to be found at Branton six hundred years ago and more. Further, some at least of these strips lay within the area of the present Great Field. The field is divided into a number of shots or furlongs, each bearing a distinctive name ; and several of the names are recognizable in the document just quoted. 'La Putte' is clearly Pitlands ; 'La Longeland' is the present Longlands ; 'La Crofta' is now divided into Higher and Lower Croftner. The 'greneweye' can be identified from the tithe map as Greenaway Lane, being the southern portion of what is now called Second Field Lane. The *culturae* east and west of the thorn-tree ('By-este-la-thurn' and 'By-weste-la-thurn') lie today in Higher, Middle, and Lower Thorn.

At this point a glance at the six-inch Ordnance Survey map will be found instructive (8). Although surrounded by outlying hamlets, Branton itself presents

⁶ Orwin, *op. cit.*, p. 46.

⁷ *Cal. Close Rolls*, 1323-7, p. 333.

⁸ Part of it is reproduced in *The Land of Britain : Report of the Land Utilisation Survey*, ed. Stamp, Part 92, Devonshire, p. 501, fig. 21.

the appearance of a typical 'nucleated' village. On its western side, immediately to the north of the Great Field, are fifty or more small enclosed fields, which, by their minute acreage and oblong shapes, irresistibly suggest that they are fossilized remnants of strip cultivation. A number of other fields presenting the same appearance are to be found adjoining the Great Field on the west and south. It is in these enclosures that we must locate some of the strips named in the allotment of 1324. The acre 'under Fairlinch' lay at the foot of the slope which bears that name, due west of the village. Further south, the six acres by and under Moor Lane ('La Morlane') now lie outside the Great Field. So also do two oblong fields adjoining Pitlands on the south, which are almost certainly identifiable with 'the two southernmost acres in the *cultura* at La Putte'.

Passing to the east of the village, we enter the manor of Braunton Abbots. Here, between the village and Park Farm, we observe another group of strips, once open but long since enclosed. The 6-inch map reveals their original character; but discoveries to which the map affords no clue are to be made by climbing Watery Lane. On the left, around the steeply sloping flank of the Combes, are unfenced strips, of late years cultivated as allotments; and on reaching the top of the hill one comes upon a new series of arable strips and grass balks, a repetition of the Great Field on a smaller scale. Up here on Braunton Down, three hundred and fifty feet above sea level, open-field cultivation is being carried on today as it has been without a break from time immemorial. There can be little doubt that the manor of Braunton Abbots has been superimposed upon the former east field, and that of Braunton Gorges upon the west field, of the primitive Braunton field system (9). Further north, at Boode, Halsinger, and Winsham, three Braunton hamlets, and still more distinctly at North Buckland in the parish of Georgeham, the present configuration of the enclosed fields indicates former strip cultivation. All of these places are four hundred feet above sea level.

Nothing, therefore, could be further from the truth than Gray's assertion that only one of the Braunton manors contains any open field. As for the 'relatively recent origin' of the Great Field, we have seen that it is over six hundred years old; and so far from being the result of gradual 'reclamation' from the estuary, it is but the shrunken remnant of an open-field system which at one time reached up to, and still partly occupies, the highest grounds in the parish. Furthermore, the six-inch map reveals that not a few of the neighbouring villages and hamlets formerly had similar field systems of their own. The real problem that awaits solution—and it is one which may be recommended as a subject for detailed local research—is why the process of enclosure has been so much less completely carried out at Braunton than elsewhere (10).

Among the surviving muniments of Tavistock Abbey is a charter whereby Richard de Ocbear, lord of the small manor, or sub-manor, of Ogbear in the parish of Tavistock,

⁹ If so, we should expect to find some tenants holding lands of equal extent in both manors. As a matter of fact, some did. For example, in 1502 John Fortescue of Weare Giffard held 50 a. in Braunton Abbots, valued at 20s, by fealty and a rent of 3s 2d, and 50 a. in Braunton Gorges, also valued at 20s, by fealty and a rent of 2s 4d (*Calendar of Inquisitions post mortem*, 2nd Ser., II, p. 390).

¹⁰ The custom of the manor here has been too strong even for the Crown, as appeared some ten years ago, when the Air Ministry proposed to turn the Great Field into an aerodrome. The plan had to be dropped 'because the land is shared by some fifty or sixty owners whose farms are on the hills to the north, and the transactions would have been too complicated, apart from throwing out of gear some fifty established farms, the value of which (at an average rental of £1 an acre) depended very largely on the possession of a portion of the field'. (*The Land of Britain*, p. 515).

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conveyed to Walter his son, in return for a payment of 100s and a yearly rent of 6*d*, a close, a curtilage, and two ferlings of land in Ogbear, made up as follows :

4 a. between the river Lumburn and Ogbear ;
 10 a. in the furlong between la Torre and Ogbear ;
 11 a. in Yerkysburghe furlong ;
 2½ a. in Broken-Cross furlong ;
 2½ a. west of Broken-Cross furlong ;

 30 a., and also 1a. of meadow.

Here again we have the unmistakable language of open-field cultivation. The charter is undated, but the names of the witnesses date it *c.* 1302 (11). It is noticeable that two thirds of this arable lay in blocks within two furlongs, but whether the strips were contiguous or scattered is not clear. Ogbear is mentioned, though not by name, in Domesday Book, as one of the estates on the fringe of Tavistock which had been held as dependent thegn-lands under the abbot until the Norman conquest. These lands were afterwards used to endow the abbot's Norman knights (12).

The account rendered at Michaelmas 1393 by the reeve of Denbury, another manor belonging to the abbot of Tavistock, shows that whereas barley was then cultivated on about seven acres of seemingly enclosed ground described as 'the lord's land at Hewelegh', wheat was being sown on sixteen acres of 'the lord's land in divers furlongs in the Combes' (*in diversis culturis in le Combes*). This is exactly the phrase that would have been used in reference to the still existing unfenced strips in the Combes at Braunton. Another fifteen acres of the demesne arable 'in divers furlongs' were given up to oats. It is clear that Denbury must be added to the list of manors formerly cultivated under the open-field system (13). The same phrase is applied in 1326 to 862 a. of demesne arable at Kingston, 536 a. at Tawstock, and 189 a. at Bovey Tracy ; but in the last-named manor enclosure had already begun, for there were in addition twenty acres not thus described, and they were valued at 6*d* an acre, twice as much as those in the open field (14).

The cartulary of Canonsleigh, now one of the Harleian mss in the British Museum, contains a number of manorial extents drawn up in 1323. From this source we learn that the demesne arable at Netherton in Farway consisted of

45 a. in Estfeld ;
 43 a. in Myddelfeld cum Chelshamcrofte ;
 45 a. in Westfeld.

133 a., valued at 3*d* an acre (15).

¹¹ Woburn muniments, D Bdle 41, no. 2.

¹² I have dealt more fully with the subject of open-field arable and enclosure at Tavistock in a forthcoming work on *The Estates of Tavistock Abbey*.

¹³ Woburn muniments, G Bdle 5, no. 3.

¹⁴ P.R.O. Inq. post mortem, C134, File 99. Twenty-seven years later the demesne arable at Bovey Tracy was reported to consist of 24 a., worth 10s ; 37 a. in the east of the manor, also 10s ; 70 a. in the north, 40 a. in the west, and 25 a. in the field called Heathfield, all valued at 2*d* an acre (*ibid.*, Miscellaneous Inquisitions, C145, File 169, no. 4).

¹⁵ Harl. MS. 3660, fo. 178.

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Netherton was not a Domesday manor. Northleigh, an independent estate before the Conquest, had been absorbed into the great Mortain fief, and subsequently partitioned (16). The abbess of Canonsleigh held one half of the manor, and her arable consisted of

11½ a. in Campo Australi juxta Wytemor ;
15 a. in Middelfeld ;
14 a. in Northfeld.

—
40½ a., valued at 2*d* an acre (17).

Both at Netherton and Northleigh we seem to be in presence of a three-field system. By contrast with these manors, the demesne arable at Canonsleigh itself appears to have lain partly in the furlongs of the open field, or what had been such until recently, and partly in enclosures. It is described as follows :

18½ a. in forlang' juxta grangiam Curie versus Occidentem in Overeforlang ;
19 a. 1 r. in Nythereforlang ;
18½ a. in Pylelonde ;
19 a. 1 r. in Eldemarnelonde ;
12½ a. in Haybeare ;
9 a. in Nyenakerlond ;
12 a. in Pugeham juxta terram Pouke de Geffreyeshulle ;
22½ a. in Knollelond ;
28½ a. in Seleham ;
2½ a. 1 r. in Langemede ;
12 a. in Les byrches ;
8½ a. in La Legh ;
4½ a. in una cultura super la Knolle ;
3½ a. in alia cultura super la Knolle juxta volatile Wodecoccorum ;
3½ a. in Wollelegh ;
50½ a. in tota terra Byestebrok.

—
245 a. 1 r., valued at an average of 4*d* an acre (18).

No ploughs at all had been at work on this manor in 1086, although it was then described as having land for one plough (19). At Rockbeare the abbess had 202 a. of arable in sixteen parcels, all apparently enclosed (20).

Two brief references may be quoted from the unpublished cartularies of Otterton and Newenham. In the first, there is record of an exchange of certain acres ' *in parva furlanga de Churlebroke* ' in the manor of Yarcombe (21). In the second there are references to land ' in Axminster field ' on the west of that township, and to scattered acres, some of them in Cleyfurlong, others in ' the furlong above Rudmede ' (22).

¹⁶ DB IV, p. 197 (Lega) ; Reichel, *The Hundreds of Devon*, p. 359.

¹⁷ Harl. MS. 3660, fo. 176.

¹⁸ Ibid., fo. 167.

¹⁹ DB IV, p. 368 (Leiga).

²⁰ Harl. MS. 3660, fo. 143.

²¹ Oliver, *Monasticon Dioecesis Exoniensis*, 1846, p. 258, no. 52. The fifteenth-century ministers' accounts of Yarcombe refer to a demesne close named Furlong.

²² B.M. Add. MS. 28649 (Prince's copy of Sir W. Pole's extracts from the Newenham cartulary and other documents), ff. 424, 428, 433.

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In 1324 the demesne arable at Ermington consisted of 82 a. in severalty, valued at 6d an acre, and 36 a. *in communi*, valued at 2d (23). At Woodbury it consisted, in the thirteenth century, of 100 a. valued at 1d each and 80 a. taken in from the waste. These last were valued at 2d an acre in 1288, but by 1321 they had gone back to waste. There remained the original hundred acres, which evidently lay in open field, for in 1362 they were described as 'one ploughland, worth nothing when unsown, because the land lies in common' (*que nichil valet quando jacet frisca, quia terra jacet in communi*) (24). In the same year a hundred acres of demesne arable at Stoke Fleming were valued at 2d each when sown, and nothing when unsown, for the same reason (25). A similar description of the arable at Loddiswell (80 a.), Ideford (40 a.), and Battishorn in Honiton (80 a.) suggests a three-field system, for in each case we are told that two thirds of the acreage can be sown, while the other third lies fallow and in common (*jacet ad warectum et in communi*) (26).

In 1334 Sir Henry de Pomeray granted a lease of a house in Brixham 'and land there in Bremele Furlong' (27). Gray overlooked this document, but he found a reference to '*communes campi*' at Brixham in 1523, which he correctly interpreted as meaning open arable field (28). He also quotes a survey of Woodhuish, in the same parish, drawn up in 1566, when the arable of that township consisted of 652 a. lying for the most part 'in twoe common felde'. The holdings were rated at so many ferlings, to each of which were assigned, upon an average, 27 a. of 'arable land lying at large in the fields and *lex Breches*' (29).

The eighteenth century estate maps of Clifton and Clist Gerrard, in the parish of Broad Clyst, exhibit all the signs of fossilized strip cultivation that have been noticed outside the Great Field at Braunton. Round each of these hamlets is a patchwork of intermixed arable strips enclosed by hedges (30). The same features are displayed even more clearly on an estate map of St. Marychurch drawn up c. 1775. Most of the strips at St. Marychurch had been enclosed, but some of them were still divided only by turf balks, locally termed landscores; and any one who held land so divided was said to hold *on* or *by* landscores (31). The same expression was used at Woodhuish and Ilington to denote intermixture of holdings (32). A large-scale map, drawn in 1820, of Molland, an extremely hilly parish on the southern edge of Exmoor, shows groups of fields divided into strips, one such group being named, significantly, New-parks. They are dotted about the parish, forming islands of strip cultivation in a district already for the most part enclosed (33).

²³ P.R.O. Inq. post mortem, C134, File 81 (3).

²⁴ Ibid., C133, File 54 (4); C134, File 66 (21); C135, File 168 (3).

²⁵ Ibid., C135, File 169 (4).

²⁶ Ibid., C135, File 155 (12). The sown portion was valued at 1d an acre at Loddiswell and Ideford, 2d at Battishorn; and the fallow at *nil*.

²⁷ Historical MSS Commission, 15th Report, Appendix VII, p. 137.

²⁸ Gray, *op. cit.*, p. 259.

²⁹ Ibid., p. 261. Dr W. G. Hoskins, to whom I am indebted for several references, informs me that the 'two great open common fields' at Sheepwash, referred to in his article on 'The Reclamation of the Waste in Devon' (*Economic History Review*, XIII, 1943, p. 81), were common pastures.

³⁰ *The Land of Britain*, p. 501.

³¹ *Transactions of the Devonshire Association*, XVIII, 1886, pp. 434, 440.

³² Gray, *op. cit.*, p. 261.

³³ *Ex inf.* Dr W. G. Hoskins.

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Finally, the authors of *The Place-Names of Devon* have noted several field-names, as for example Hedlonde and Forelond, which they no doubt correctly take to be associated with strips in common fields. They mention also two or three compounds of *furlong* (34). Unfortunately the scale of their work has precluded them from stating where these names occur. But enough has been said to demonstrate that open arable fields at one time existed in every part of Devon. Clearly it will not be possible in future to rule out all connexion between Devonshire and the midland system, or to account for every one of its distinctive agrarian practices as the result of 'Celtic influence'.

On the other hand, there is plenty of converging evidence to prove that Devon was a county in which the process of enclosure began early, and in which the isolated farmstead had a place from the first. On these points the received opinion is not likely to be upset. But a systematic investigation of the whole subject is now urgently required. In particular, it is to be hoped that some one will be moved to undertake a detailed study of the remarkable survival at Branton, tracing the history of the Great Field from the remote past and providing a full description of its recent and present management. The Great Field may well be a thousand years old, and certainly merits as painstaking an investigation as has been devoted to the surviving open fields at Laxton and elsewhere. Aerial photography, and a careful scrutiny of the six-inch Ordnance maps, combined with research into the extant documents of the thirteenth and early fourteenth centuries, will doubtless bring to light traces of many other formerly open fields in Devonshire. When, thanks to such investigation, we have acquired a fuller understanding of the morphology of Devon villages and hamlets, some retrospective light may be thrown upon that most obscure phase of Old English history, the Anglo-Saxon occupation of Devon. The contrast between the 'nucleated' countryside and the land of dispersed settlement may then appear less dramatic than it did when Maitland first called attention to it; but we shall perhaps have more reason to admire the adaptability with which the early English colonists varied their agricultural technique to suit the requirements of this difficult new territory.

POSTSCRIPT

Since writing this paper I have had the opportunity of visiting Branton Great Field and Branton Down under the guidance of a well-known local resident, Mr A. H. Slee. The first thing that strikes one is the total absence of those alternating ridges and furrows believed by some writers to have been essential characteristics of the open field. The perfectly flat surface of the Great Field is broken only by the grass balks, which here as elsewhere in Devon are called *landscores* (or, in the local pronunciation, *landsheds*). These turf boundaries, most of them little more than a foot wide, are more economical of space than any hedge-bank, and do not harbour so many rabbits, but on the other hand they propagate couch-grass and are infested by countless rats. In 1889 there were 491 strips, or 'lands', as they are called locally, divided among fifty-six proprietors. Today the proprietors number only twenty, two of them holding each a single land. Where the larger owners have succeeded in consolidating their lands the intermediate *landscores* have disappeared; but those which remain are numerous enough to show quite clearly the original size and shape of the strips. In 1843 Higher Thorn, the area of which is 20.367 a., contained thirty lands, and Middle Thorn, which

³⁴ Gover, Mawer, and Stenton, *The Place-Names of Devon*, 1931-2, p. 690. In the early years of the thirteenth century there is mention of land in Moor-furlong ('Morvorlange') at Buckerell (Hist. MSS Comm., Var. Coll., iv, p. 59).

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is 15.92 a., contained nineteen. These have now been reduced to twenty-four and fourteen respectively.

In 1938 the cereal crops raised on the Field were :

Wheat	..	2903 bushels	Oats	..	2380 bushels
Barley	..	2507 „	Dredge	..	1302 „

Potatoes, broccoli, and sugar beet are also grown. Mr Slee informs me that within living memory the Field was thrown open for common grazing for a month or two after Michaelmas, but that the ordinary pastures lay in the belt of marsh-land, over a mile wide, situated between the Great Field and the estuary.

The Branton tithe map indicates that in 1843 there was a tiny patch of strip cultivation at the north-eastern edge of the parish, on the barton land of the manor of Beer Charter. It also reveals the presence at that date of another patch of strips on the sloping bank of Knowl Water, south of Park Wood and the old Barnstaple road. Neither the shape nor the appearance of the two fields in which this ground is now enclosed gives any hint of its former pattern. In this instance every trace of strip cultivation has been obliterated. It follows that while the existence of ancient strips is frequently betrayed by the present form of their enclosures (as for example in the parish of Goodleigh, two miles inland from Barnstaple, where another such group is plainly visible), the absence of the characteristic strip configuration is no proof that strips did not exist there once. Where there were no ridges to obstruct cross-ploughing, the whole field-pattern could be recast without great difficulty. Further, the principle of 'geographical determinism' enunciated by Mr A. L. Rowse (35) in connexion with the open fields of Cornwall can no longer be upheld, for the evidence of Branton proves that open strips were cultivated on steep hillsides as well as on comparatively level ground. As the case now stands, we must face the possibility that nearly every village and hamlet in Devon may once have had some open field.

⁸⁵ *Tudor Cornwall*, 1941, p. 34.

The Restoration of the Monastery Church of Debra Damo, Ethiopia

by DEREK H. MATTHEWS

I WAS enthusiastically received by the monks of Debra Damo who gave me every help and encouragement in the project of restoring their church, the most ancient surviving in Ethiopia. The scheme was first mooted by Mr D. R. Buxton, who visited the church and found it in a state of collapse (1). The efforts of Mr O. G. S. Crawford, the Society of Antiquaries, and the British Council, resulted in the Emperor's agreeing to spend up to £5,000 on the works, and in my being appointed architect in charge of the restoration. I had the unique opportunity of entering parts of the building not hitherto seen and recorded by Europeans, and during the process of partial demolition I was able to discover the exact method of construction, this knowledge throwing light on ancient Axumite building methods.

It is not known exactly how old the church is. It is certainly the most ancient and perfect of the early Ethiopian churches, and an important example of an early manner of building in that country.

The method of construction is unusual (FIG. 1); the walls consist of tile-like stones set in earth mortar, strengthened with longitudinal beams which are themselves fixed to the walls with cross-pieces, projecting, and called 'monkey-heads' by the Ethiopians. Such a method of construction has been used in countries as far apart as Crete, Asia Minor, and Tibet. It also seems to have been the normal constructional method of the Axumite builders, who translated the pattern of horizontal timber, monkey-head and window framing into the decoration of the storied obelisks of Axum, nearby. This is yet another example of timber forms being translated into stone, a common architectural trend. Even today, the tradition is still alive, and modern church builders in this part of Ethiopia still use timber in a similar way to stabilize their walls.

The preservation of this unique building is undoubtedly due to the fact that the monastery is situated high on a rocky mountain, entirely surrounded by cliffs, and is approachable only by climbing with ropes up the vertical rock face (PLATE IIA). I myself had to scale the cliff on each visit to the monastery, and all building materials (cement-bags, reinforcing rods, sand, stone and scaffolding poles) had to be hauled up the cliff. Its inaccessible position, seven days by lorry from Addis Ababa, and three hours' mule trek across precipitous country from the nearest motor track, made the restoration a difficult, yet fascinating, task.

I was treated with great hospitality by the monks, for word had gone ahead that the Emperor was sending an architect to renew their church. The community gave me an Imperial welcome with their richly coloured robes, umbrellas, and silver crosses, to the accompaniment of chanting, and the music from drums and sistra, and they entertained me with their own brand of beer ('talla'), and excellent honey wine ('tedj'). At all times during the works they were most friendly and helpful, bringing me sheep for meat,

¹ Buxton 1 and 2 (see pp. 196, 198, below).

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and eggs and chickens in abundance. At the end of the works they thanked me, saying they wished to give me a token of appreciation, but as they were poor, would I accept thirty Haile Selassie shillings.

PLAN OF WALL TIMBERS

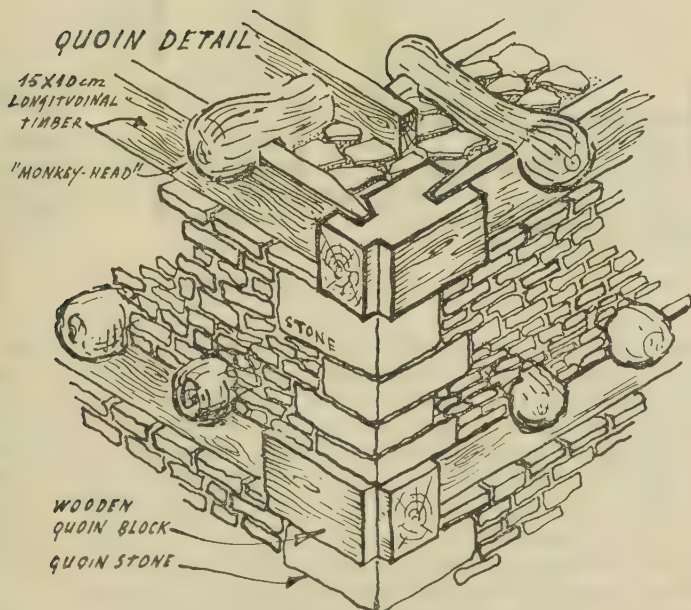
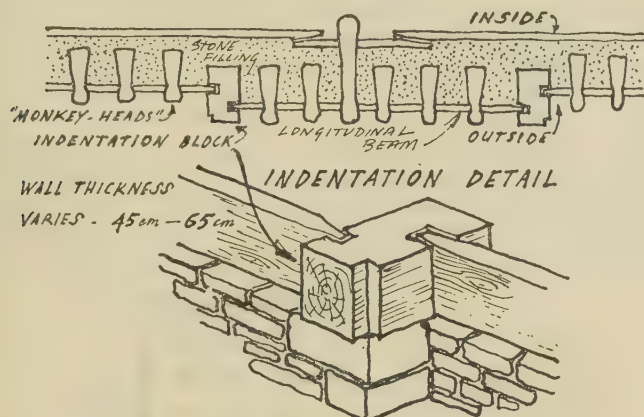


FIG. 1. WALL CONSTRUCTION, SHOWING ARRANGEMENT OF LONGITUDINAL TIMBERS, 'MONKEY HEADS' AND QUOIN BLOCKS

During the course of the works, I covered 5,700 miles in Ethiopia and Eritrea by motor lorry, collecting the necessary workmen and supplies. The difficulty in obtaining petrol for transport further aggravated the initial difficulties. Whilst stone was being

broken on the site, and sand transported from the river, and hauled up the cliff, I had to hunt for other materials, and then transport cement on mule-back during the period of the rains.

Finally having obtained all the necessary supplies, I established myself permanently on the mountain top, with a staff of servants, Italian and Ethiopian masons and labourers. After eighty-two working days, the restoration work was complete. Although we were obliged to work during the period of seasonal rains, only eleven hours were lost on the site because of bad weather.

GENERAL DESCRIPTION OF THE CHURCH

If the building, which is approximately 20 metres by 9, is divided lengthwise into five parts, the two parts on the west end form a part of the building having an upper floor (FIG. 2). There is similarly an upper floor over the section containing the sanctuary and the two adjoining rooms, and there are long lofts over the aisles, flanking the nave. Over the sanctuary is a small dome of timber, now covered with cloth (FIG. 3 and PLATE

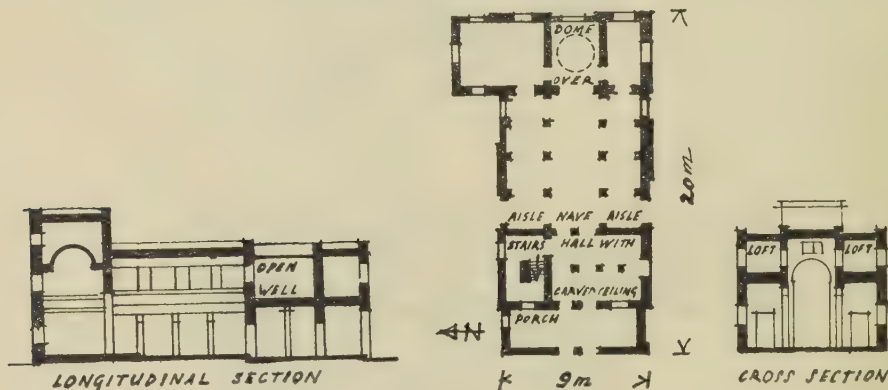


FIG. 2. PLAN AND SECTIONS OF CHURCH

11b). Some painted fragments lying near the dome are apparently infilling panels which formerly were part of the dome. The monks said the paintings were not more than two hundred years old; the only recognizable piece is approximately 40 cm. by 60 cm. and contains two head and shoulder portraits, carrying crosses, and a dove; in Ethiopian characters is written 'Abuna Samuel', 'Abuna Aregawi', and 'Abuna Tacla-Haimanot'. The ribs of the dome are decorated with painted meander patterns. The dome is only two metres in diameter, and is not visible externally, being protected from the weather by a raised portion of the flat earth roof. Three years ago the nave had a fine arched timber roof construction (2), which became unstable and was replaced by the monks themselves with a flat beam and board ceiling, before I arrived.

On the main axis, the entrance leads into two wide vestibules. The first is a partly open porch, of later construction yet similar to the main body of the church; the second, the inner entrance hall, has a fine carved panel ceiling, and is not so wide as the porch, because part of the space is occupied by a staircase which winds round a block of masonry, typically Axumite in construction. This staircase leads to an open light-well

² Buxton 2, Plate II d.

RESTORATION OF THE MONASTERY CHURCH OF DEBRA DAMO

over the inner entrance hall, and to the lofts or upper rooms of the church, and the flat earth roofs.

The main part of the church can be entered either from the inner entrance hall by a west door, or by means of doors in the north and south walls. This part of the

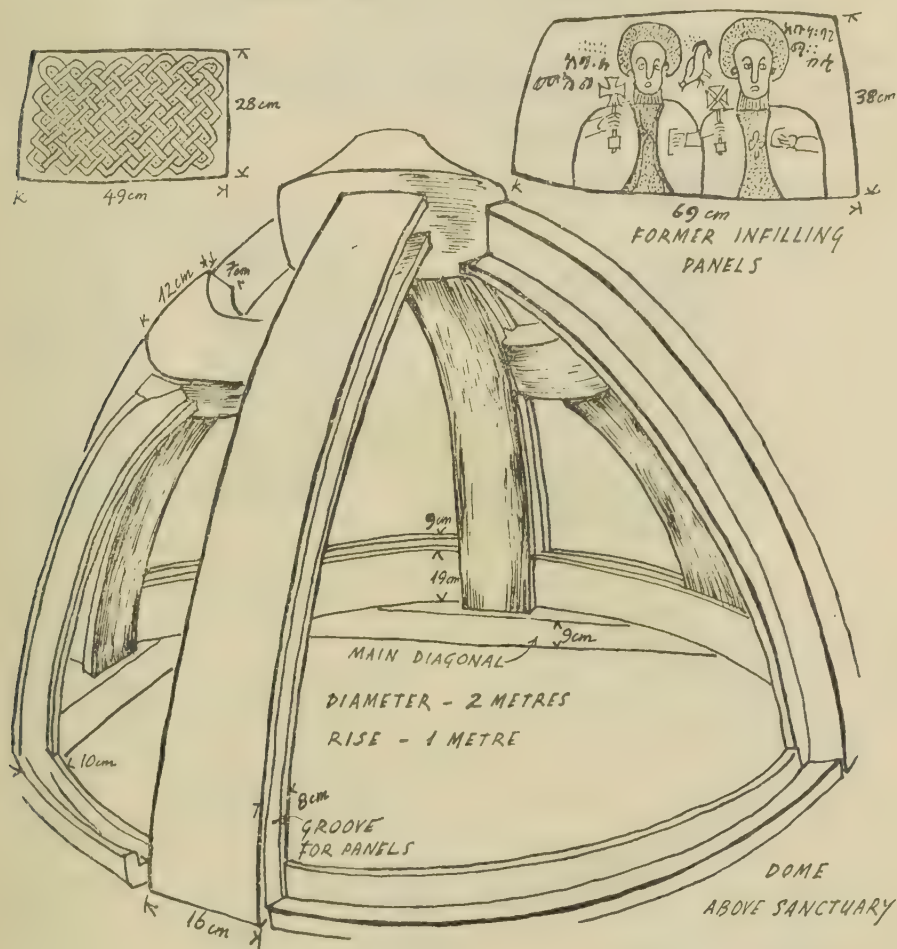


FIG. 3. WOODEN FRAMEWORK OF DOME ABOVE THE SANCTUARY, AND TWO OF THE FORMER INFILLING PANELS
(The dome is now covered with cloth)

church is lighted indirectly by small windows in the lofts above the aisles, and also by ground-floor windows in the aisles themselves, and by a high west window giving on to the light-well.

The nave is separated from the sanctuary by a wall with a carved timber arch (PLATE III). There are doors into the sanctuary from the small rooms on each side of it,

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which are in turn reached by doors at the east end of the aisles. The room on the north of the sanctuary is larger than that on the south, and contains the remains of the king

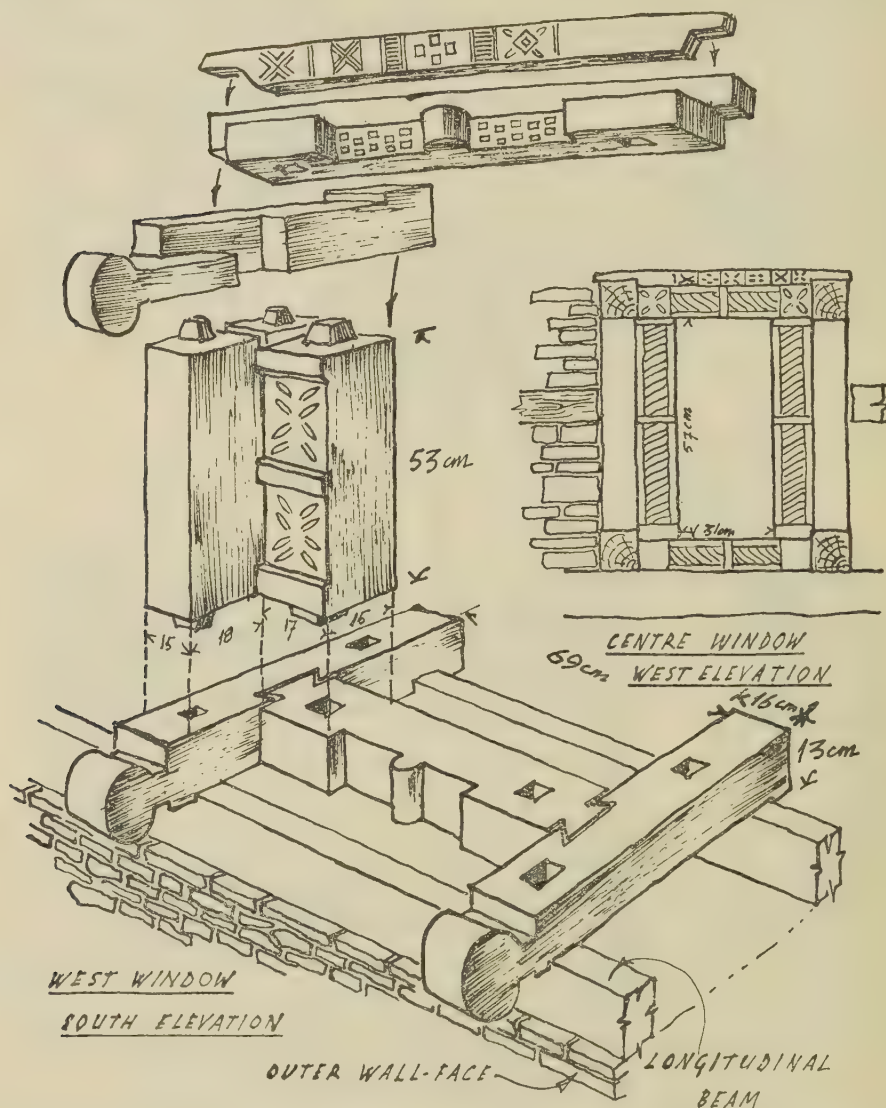


FIG. 4. EXPLODED VIEW OF A WINDOW IN SOUTH WALL SHOWING CONSTRUCTION AND DECORATION, AND ELEVATION OF THE CENTRE WINDOW OF SOUTH ELEVATION

Lebna Dengel, and his son Galadewos; this room projects from the main body of the building, and for this reason it might have been added at a later date, as it is not part

RESTORATION OF THE MONASTERY CHURCH OF DEBRA DAMO

of the fundamental plan shape. However it is built upon a base which is Axumite in design; this base is only visible on the north of the church, and is stepped in three intervals, like those in the ruins at the Axumite sites of Cohaito, Axum and Jeha. This presupposes a very early remodelling to an original Axumite building, which might date from the pre-Christian Axumite period.

The plan is noteworthy for the unusual indentations within the thickness of the walls. Such a feature is yet another link with old Axumite building methods, for it occurs at the other Axumite sites in Ethiopia, and in a minor form, it may be observed in the plans of the storied obelisks at Axum. The reason for the indentations may well be that the distance between them is a convenient length for the longitudinal beams of the wall, whose ends are always mastered by a wooden quoin-block (an architectural fake making the beams appear thicker than they really are). (FIG. 1).

The walls consist of tile-like stones set in excellent earth mortar, with larger quoins of a different stone. The monks say that the small stones for the church came from Eritrea, where there is said to be still a heap of stone that was quarried for the building, at Zabanbur near Adi Caieh. The walls owe their preservation partly to the timber work which stabilizes the wall structure. The effect is of a series of bands on the wall surface consisting of timbers approximately 15 cm. deep, alternating with bands of stonework of varying depth from 24 cm. to 40 cm. The longitudinal timbers are fixed, and kept upright, by a series of cross-logs notched over them, and built into the wall ('monkey-heads'). A very few (not all) of these cross-logs pass through the wall, and are notched over the twin beam on the inside. The long beams are further tied together by means of the window construction (FIG. 4 and PLATE IVa). The longitudinal timbers of the wall are necessary owing to the small size of the stone used, and the fact that it is set in earth mortar. Olive wood is used for all constructional parts, except in the flat roof construction, where euphorbia is used.

Widely projecting slates form string courses outside at both the ceiling levels. A parapet surmounts the wall, with slits to allow rain water to escape from the flat roof.

The windows and doors have the same construction that was interpreted in solid stone in the storied obelisks at Axum, and there are similarities in detail with the windows and doors in both the built-up and rock-hewn churches in Lasta, and other parts of Ethiopia (FIG. 4 and PLATE IVa) (3). The tradition of making openings in walls in this way is still followed in Northern Ethiopia today.

There are six monolithic columns in the nave, one in the inner entrance hall, and the pair built into the outer west wall. They are not all of the same size, and they might have come from another building.

The nave and sanctuary are encircled by a wooden entablature whose metope panels are carved with swastikas, crosses, and plaited and meander decoration, reminiscent of Byzantine and Coptic art (FIG. 5 and PLATE III). Such a timber entablature has been translated into stone elsewhere in the numerous rock-hewn churches of Ethiopia. The carved timber ceiling in the entrance hall contains, in addition, representations of animals (there are no animals carved in the frieze panels) (4).

³ See Buxton's two articles, *passim*.

⁴ In the Asmara Museum there are similar carved panels which were taken from a demolished church in Asmara, of the same type as Debra Damo. [It is hoped to publish a special article on these panels in a later number. Mr Matthews was able to take excellent photographs of all of them. See also Buxton (1), plate IV. Ed.]

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THE INFLUENCE OF RITUAL ON PLANNING

It is interesting to note that the plan of the monastery church is not ritually convenient to the monks. They generally make modifications by hanging curtains in the nave to subdivide it. They asked me to make the entrance porch deeper, because it is not large enough for them to play their drums and sistra. The plan of Debra Damo is unlike the modern churches in Ethiopia, which are generally circular, enclosing a square sanctuary; it is nearer to the plans of Axumite ruins. The Debra Damo plan has also been used in the rock-hewn and built-up churches of Lasta, and other regions.

The church is situated in the usual compound, common to all Tigrai churches, surrounded by a wall approximately three metres high, with an elaborate gate-house having an upper floor, and a free-standing bell-tower. The treasury and other buildings are grouped nearby. There is a rock-hewn cistern north of the church, containing holy water.

THE ORGANIZATION OF THE MONASTERY

The monastery buildings are grouped on top of the amba* like a large village (FIG. 6), and are the normal stone houses (with flat earth-roofs) of Tigrai (PLATE I). Each monk has a house with several rooms, including an upper room for contemplation and prayer, and a walled garden (FIG. 7). The spaces between the groups of houses with their walled gardens form winding lanes leading towards the church, the meeting hall, and the rock-hewn cisterns for water supply.

The community is divided into two parts, the 'First Association' composed of those monks belonging to the district, and owning land in the vicinity, and the 'Second Association' which consists of those who come from afar. The latter share all their worldly goods among themselves, and lead a very frugal life. There are large numbers of small boys who come to Debra Damo to learn Geez and to chant. The monastery is thus a place of study as well as prayer. It is also a favoured burial place, and those who can afford it are buried on the top of the amba in caves.

The loose-knit organization of the community allows decisions to be argued out in the assembly of monks, usually out of doors in the shade of gaily-coloured umbrellas. The Head of the monastery is elected by the whole community for a long period. At present there are about three hundred monks; it is said that at one time there were as many as a thousand.

There is a second church on a ledge below the top of the amba, at the point where Abuna Aregawi is reputed to have vanished. Its plan is rectangular, with an inner sanctuary completely surrounded by a corridor. The walls of the inner part are very old, and are similar in character to those of the main church, with timber and stone technique, and wood carvings in the same Ethiopian-Coptic character. The outer wall of the small church is comparatively new, and similar to the rest of the monastery buildings.

THE AGE OF THE CHURCH

I was told by Getai Gabre Ghiorghis, a monk, that the church was first built in the year 537, which is 1405 years ago by the Ethiopian Calendar; and that it had been renewed but not since the time of Hatsay Lebna Dengel (1508-40), who repaired the south wall, and whose remains are in the church.

* Amba means hill or hill-top and from the use of such came to mean 'hill-fort', just as Debra (with a similar meaning) came to mean 'monastery'. ED.

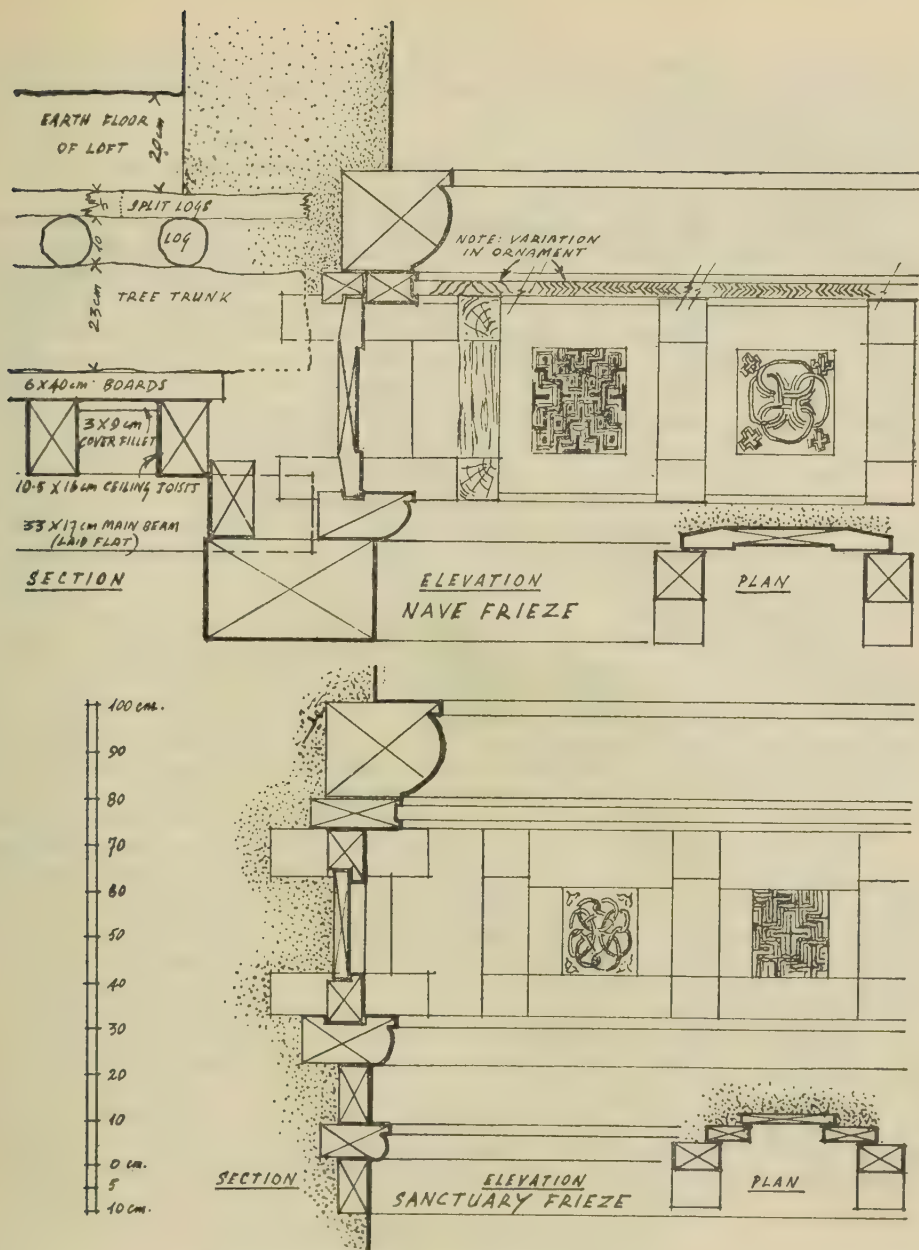


FIG. 5. SECTIONS THROUGH FRIEZES IN NAVE AND SANCTUARY

The panels in nave and sanctuary are different in construction. The section through the nave frieze also illustrates the construction of the floor of the loft above the aisle, which is supported on tree trunks 23 cm. in diameter, this rough carpentry being masked below by boards, ceiling joists and a beam forming a clean finish inside the aisle

Other monks said that the church was built in the year 370 and the plinth of the church (which is Axumite in design) had been built by Hatsay Gabre Maskal; and that Hatsay Lebna Dengel built the upper part.

Regarding the legends of the building, it is difficult to establish whether the king 'Gabre Maskal' is the son of Kaleb (6th century), or the king Amda Tsion (1313-43) whose second name was Gabre Maskal.

The priests said that there had not been a building on the site before the Monastery was founded. They are bound to uphold the legend of the foundation, but it is not unlikely that there was once on this site a pre-Christian Axumite temple or house which was converted into a church when Christianity came; for in addition to the Axumite base, plan shape, and construction, there are three fragments of Axumite capitals lying outside the church, and the monolithic columns now incorporated in the structure are of different sizes, and might have come from an older building. There is also a carved sandstone block built into the gatehouse, looking as if it came from an older building.

From 14th century manuscripts found at Debra Damo by Dr A. Mordini (5) it is apparent that until the 14th century the sister monastery nearby of Debra Libanos (6) was more important, after which Debra Damo came into ascendancy, and was at the height of its power. Debra Damo has been proved to have been a place of pilgrimage and studies at least since the 13th century, and Saint Tacla-Haimanot studied there and received there the garb of a monk. (The many manuscript fragments prove that Debra Damo was active at this time).

The difference between the carved panels in the frieze and those in the ceiling, and the differently cut capitals, make it seem likely that these elements were not all made at the same time, but assembled together in the present form. Indeed some of the ceiling panels look as if they had been cut down to fit the framing. Thus it is not possible to date the building from any one element. The fact that Debra Damo was apparently eclipsed by Debra Libanos, and then acquired a new lease of life in the 14th century, points to the possibility of at least one rebuilding, at that time.

The form and construction of the church relates it directly with early Axumite building, of the period of the storied obelisks. It seems probable that an Axumite building was converted into a church at the foundation of the monastery. It is known that Debra Damo was given a new lease of life after perhaps a period of decline, and would then have been partly rebuilt. This final reconstruction was probably on the same lines as the original Axumite building, and would account for the perplexing survival of such a very ancient style of building.

In my opinion alterations which might have taken place when Debra Damo revived in the 14th century were merely in the form of repairs to the fabric, and not a radical remodelling. In spite of possibly a series of reconstructions, including the one which has only just been completed, the original Axumite character of the building has been retained and the building today is substantially the same as when it was first built (perhaps before the 9th century). It seems unlikely that any alterations were made to the fabric after the death of Lebna Dengel (1540).

THE DEFECTS OF THE BUILDING

I found that irreversible movements had been taking place within the walls. Alternations of rain and sun had set up movements which, over a very long period, had

⁵ Conti Rossini, 'Pergamene di Debra Dammó', *Rivista degli Studi Orientali*, vol. XIX, 1940.

⁶ Not to be confused with the celebrated monastery of Debra Libanos in Southern Ethiopia.

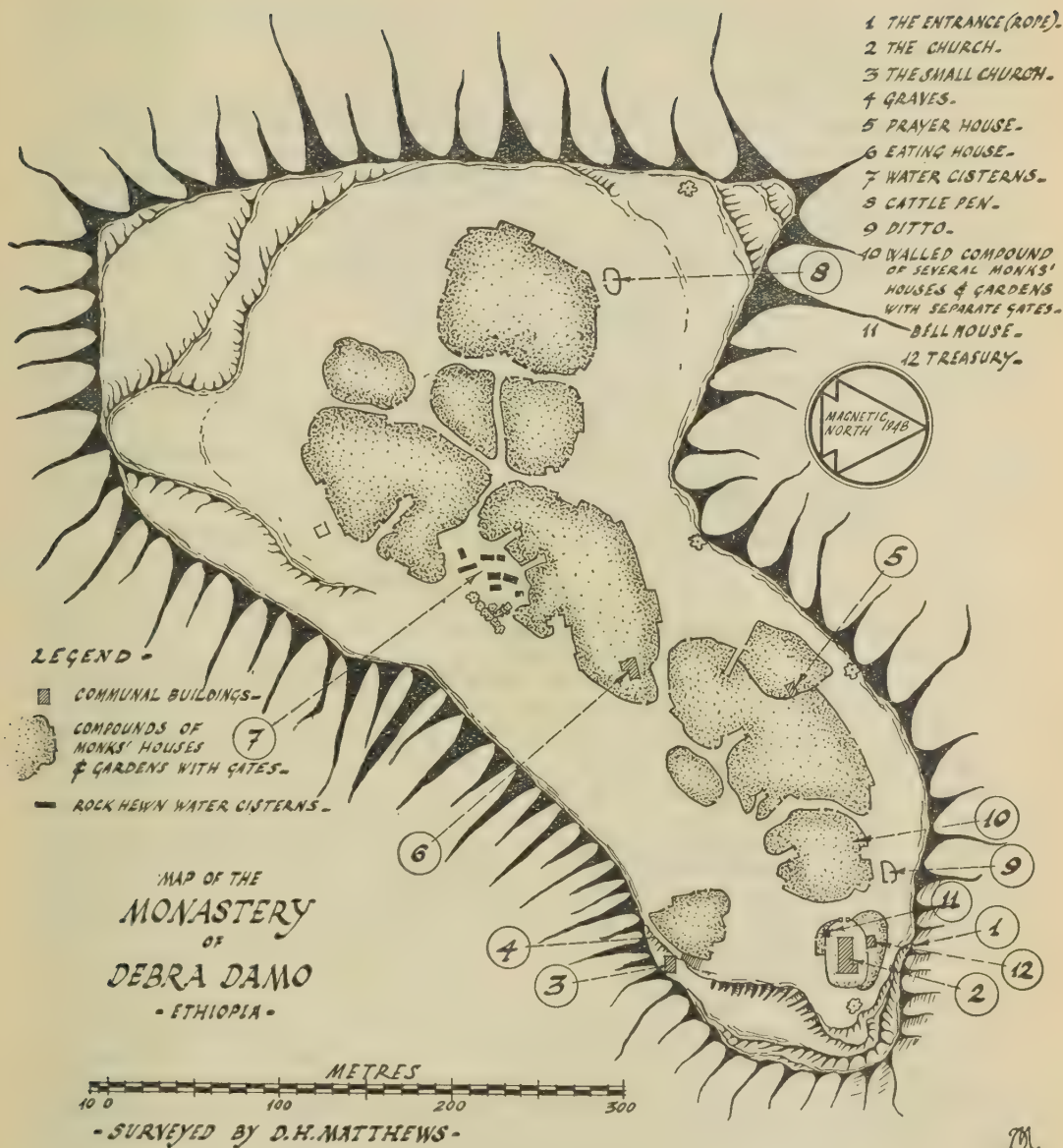


FIG. 6

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become noticeable. All the external walls were leaning outwards mushroom-like. The most unstable portions were leaning as much as 45 cm. beyond the vertical, over a height of 6 metres ; the average amount of lean was 25 cm. ; many sections of wall were only 10 cm. out of the vertical.

In many cases the movement had only taken place in the outer half of the wall, with the face of the wall peeling off ; the inner wall planes were not badly affected, except on the north ; there were vertical cracks at the quoins and junctions with cross walls.

The north wall had leaned out so far that it could no longer support the flat earth roof, which had fallen in over the north loft. The building had been shored up some years ago by the Italians, who, as a temporary measure, had covered part of it with corrugated iron sheets. The foundations are sound, being placed upon solid rock.

METHOD OF RESTORATION

The external walls were strengthened by the placing of two reinforced concrete beams, connected together with vertical ties, within the thickness of the walls, encircling the building like belts. In addition, diagonals and cross-ties were placed where necessary. Having completed the work, the strengthening members are not visible from inside or outside the church. The walls which were leaning dangerously were demolished, all timbers indexed, and the whole reassembled in exactly the same form as before. At the same time it was a simple matter to repair minor defects.

The building is now structurally sound and in good order (PLATE IVb).

APPENDIX : LEGENDS OF DEBRA DAMO

THE LEGEND of the Foundation of Debra Damo as related to me at Debra Damo by the Head of the Monastery, Memhir Wolde Mariam :

“ Abuna Aregawi was one of the nine Saints who went to Axum. After they had “ been there some time, they decided to go out separately to different places to spread “ Christianity in Ethiopia. Abuna Aregawi came to the flat-topped mountain where “ the monastery now is, and wished he could climb the cliff and live on the top. A “ serpent told him that there were only birds and the sun on the top, so Abuna Aregawi “ prayed, and the serpent reared itself up and placed the Abuna on the top. Whilst this “ was happening the Archangel Gabriel stood by with a sword ready to slay the serpent “ if it should attack Abuna Aregawi. When the Abuna went up he dropped his cross, “ and it fell on the stone which is today kissed by all who enter or leave the Monastery. “ The place where Abuna Aregawi found himself is where the sanctuary is today. The “ Abuna then asked Hatsay Gabre Maskal to build a church, which he did ”.

TRANSLATION out of ‘ Gedli Abuna Aregawi ’ (Work of Abuna Aregawi), a book in possession of the monk Getai Gabre Giorghis (translated by Ato Haile Zarrafa).

The building of the church of Debra Damo. Gabre Maskal sent his army to collect materials and workmen with knowledge ; he sent to the north, east, south, and west and they brought carts, ladders, and equipment. The carts were three and a half metres long for the stone. He made a ramp in order that the animals and workmen could climb. They brought water and stone from below. He built the church with a lot of wood, fashioned into a good shape. It is very good and takes your heart. He finished the building in two years and built it after he had been king for one year. He collected all the necessary furnishings for the church, and gave them to the Monastery. He gave twelve gold crosses, and gospels in gold and silver, and the story of Paul, and everything

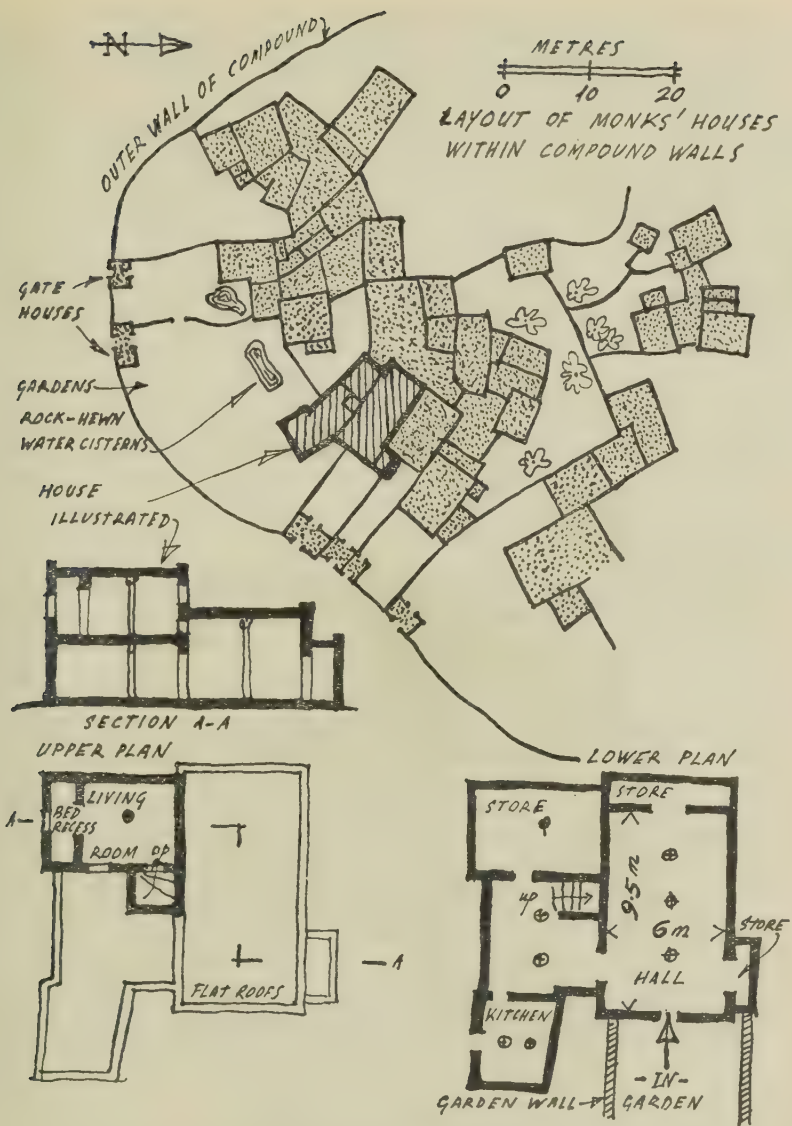


FIG. 7. PLAN OF PART OF ONE OF THE COMPOUNDS, SHEWING THE BACK-TO-BACK HOUSES, WITH INDIVIDUAL GARDENS SURROUNDED BY A COMPOUND WALL WITH GATES. PLANS AND SECTIONS OF A TYPICAL HOUSE

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else that is necessary for a church. When Gabre Maskal built churches he started with Debra Damo ; it was the second church in Ethiopia after Axum. He gave all his property and riches to Debra Damo. He asked the Abuna Aregawi to become priest, and he agreed and became priest, and they brought angels for him ; and the Holy Ghost came over the communion, and over all of them. The Abuna and Gabre Maskal took communion, and also the others ; and God spoke with Abuna Aregawi and said that all who took communion that day would be assured of a place in heaven. When he left the church, Gabre Maskal collected all the poor people and also the big people of his government, and made a big feast at Debra Damo, giving food to the hungry and clothes to the naked, for the good of the church, Abuna Aregawi said he would protect Gabre Maskal from danger, and follow him when he died ; and Gabre Maskal bowed to the Abuna, and said ' Bless me ', and then ' Accompany me ', and when he left, he asked whether he should leave the ramp up the cliff, and Abuna Aregawi said ' Dahamemo ' which means ' Take it off ', and he asked Gabre Maskal to provide something like a serpent to climb with, because it was good that people should feel afraid when they saw the cliff, and pray for God's help ; so the ramp was taken away, and a rope made with leather thongs in the form of a serpent as it still exists today. Afterwards the place was called ' Debra Damo ', from the words of Abuna Aregawi (Dahamemo). Before this it had been known as ' Debra Halleluya ' as it is still sometimes called today, for when Abuna Aregawi had first gone up on the top, he had cried ' Halleluya ' to the north, east, south and west.

OTHER LEGENDS on the history of Debra Damo. Abba Haile Mariam, a monk, told me that a pagan queen Gudite, who was burning many churches in Ethiopia, captured Debra Damo and used it as a stronghold for twenty years. At this time, the mountain had been used by the Emperors as a prison where they kept their relatives in captivity to avoid rival claimants to the throne ; and at the same time it was a monastery.

When the queen came, some of the monks were killed, and some went away. The queen made a ramp up the cliff, three and a half metres wide, at right angles to the cliff near the present position of the rope, so that animals could go up, and horses and mules were stabled in the church ; I was shewn where the threshold of the southernmost of the two western doors had been repaired, after being damaged by the hooves of the animals. During this period, the settlement became an ordinary town, with women living there.

The mountain was eventually retaken from the pagans by a king who brought ladders and scaled the cliff in the night. He brought monks, and re-established the Monastery.

REFERENCES

1. D. R. Buxton. ' Ethiopian rock-hewn churches ', *ANTIQUITY* xx, 1946, 60-9.
2. ——. ' The Christian antiquities of Northern Ethiopia ', *Archaeologia* xcii, 1947.

PLATE I



DEBRA DAMO, ETHIOPIA : GENERAL VIEW OF MONASTERY BUILDINGS ON TOP OF THE AMBA (flat topped hill)

PLATE II



b. DEBRA DAMO: THE DOME OVER THE SANCTUARY



a. DEBRA DAMO: THE ONLY WAY OF APPROACH TO THE MONASTERY
Note bag of cement being hauled up

PLATE III



DEBRA DAMO: NAVE FRIEZE AND ARCH BETWEEN NAVE AND SANCTUARY



2. DEBRA DAMO: WINDOW SHOWING WOODEN FRAMEWORK
EXPOSED DURING RESTORATION



6. DEBRA DAMO: STATE OF THE CHURCH AFTER COMPLETION OF WORK

A second fixed point in the Chronology of the Harappa Culture

by J. F. S. STONE

FIXED points in the chronology of the Harappa Culture are not abundant and such as exist tend rather to emphasize the earlier phases of that remarkable civilization. Evidence for close contact with Akkad about 2300 B.C., based primarily on stamp-seals, has been the subject of review by Piggott (1), and much clearer light has been forthcoming as a result of excavations at Harappa by the Archaeological Survey of India during 1946 under the direction of Professor R. E. M. Wheeler (2). These excavations included cuttings through the rampart of the citadel, and investigations of the later cemeteries superimposed on the culture. Whilst accepting the evidence for the earlier fixed point Wheeler faces up to the problems raised by these cemeteries and is strongly inclined after reviewing the facts available, and certain passages in the Rigveda, to agree with Childe that the ' Cemetery H intruders " may belong to Aryan invaders ', the conventional date for whose first incursion into India is the 15th century B.C. '. As a result he concludes that ' the combined weight, such as it is, of these various indications suggests the millennium 2500-1500 B.C. as a possible inclusive date for the mature Harappa civilization, without prejudice to the still-unplumbed depths of Mohenjo-daro '.

Attention has recently been focussed by Piggott on these later phases of the civilization as a result of a study of the type and distribution of certain spiral headed and animal headed pins, and of a bronze mace-head found at Mohenjo-daro and Chanhudaro (3). He here sees clear evidence pointing to trade contacts or folk movements from the West and affecting India at the end of the Harappa phase, if not indeed when it was actually defunct, probably ' after 2000 B.C. rather than before and possibly some centuries later '. And with Wheeler he does not appear to be disinclined to accept the traditional date of about 1400 B.C. for the incursions into India ; though both are fully aware, and in fact state categorically, that the Akkadian contacts are the only well fixed chronological points.

Now it so happens that another fixed point is available which would appear to fall within and add precision to this debatable latest phase. Beads are easily transportable articles over great distances and as easily lost, and Beck has already drawn attention to a number of virtually identical etched carnelian beads found in Akkadian deposits and at such Indus sites as Mohenjo-daro and Chandudaro (4). But it is to certain of the faience bead series that I now wish to draw attention. These are fairly abundant in Harappa Culture contexts, and a number from Harappa itself have been the subject of study by Beck (5), but prior to recourse to spectrographic analysis.

¹ *ANTIQUITY* XVII (1943), 178 ff. and *Ancient India*, no. 1 (1946), 21.

² *Ancient India*, no. 3 (1947), 60.

³ *Ibid*, no. 4 (1948), 26.

⁴ *Antiquaries Journ.*, XIII (1933), 390.

⁵ M. S. Vats, *Excavations at Harappa*, I (1940), 403 ff.

Faience consists almost entirely of finely ground quartz grains cemented together thermally by means of other materials such as an alkali or lime or both together, and subsequently glazed with a coloured, usually blue, glass (6). Such an artificially manufactured material is fairly readily susceptible to analysis, and by modern spectrographic means traces of elements or impurities fortuitously or intentionally introduced can be readily detected. Thus qualitative and quantitative estimation of the main constituents and of traces of impurities permit one to establish identity or dissimilarity when objects from different sources are compared. And it is only natural to expect that the composition of faience must vary considerably from place to place and from time to time in view of its early discovery and long persistence as a manufactured material.

The segmented variety of faience bead is of comparatively common occurrence over great lengths of time, and appears to have been a favourite form in many countries (7). Whilst studying this type of bead in 1935 Beck and I examined two from Harappa (8) and were surprised to find how closely they resembled similar beads found in England. But as they were at that time dated *c.* 2750 B.C. they were discarded as being of too early a date to affect the immediate problem of the origin of the British specimens. These two beads were on string no. 177 of the selected beads submitted for examination and were recorded as having been found at a depth of 19 feet 8 inches in Stratum VII in Square I 12/20 of Mound F (9). Such a method of recording finds in the absence of stratigraphical associations prevents their being used for chronological purposes and, though apparently early, one cannot trust this inference from the published report. All that we need note here is that twenty-three other segmented faience beads were recorded as having been found at different places and in association with various strata (10).

Now very similar segmented beads have been found once again during the recent excavations by Wheeler at Harappa, and two are stated to have come from Period v and post-rampart horizons respectively; whilst of two others, one came from the debris layer and one from a post-Cemetery H layer of the cemetery area (11); all implying a comparatively late date, and certainly not an Akkadian context of *c.* 2750 B.C. Their rarity implies that they were intrusive, and their close similarity to Eastern Mediterranean specimens suggests that some at least were derived from that source. I propose here to adduce evidence to show that the Harappa segmented beads examined by Beck and myself in 1935 were then erroneously dated about 1000 years too early and that in reality *c.* 1600 B.C. would be nearer the mark.

Through the kind assistance of Dr P. D. Ritchie, and of the Courtauld Institute of Art (University of London), a number of specimens of segmented beads from a variety of sources including Harappa were examined spectrographically during 1935, i.e. at a time too late for inclusion of the results in the articles on British Bronze Age and Harappan faience beads, although an appended note in the former drew attention to the fact that the composition of the Wiltshire specimens and certain of those from Tell el Amarna were identical, and therefore that the former had been derived from Egypt (12).

Unfortunately the late war, and the death of Mr H. C. Beck, resulted in the loss of the original spectrograms prepared by Dr Ritchie. Certain extracts from these in tabular

⁶ *Archaeologia*, LXXXV (1936), 207.

⁷ *Ibid*, 203.

⁸ *Ibid*, 225 and pl. LXIX, fig. 2, 1.

⁹ M. S. Vats, *Excavations at Harappa*, I (1940), 406 and 417; II, pl. CXXXIII, fig. 6 b and c.

¹⁰ *Ibid*, 434.

¹¹ *Ancient India*, no. 3 (1947), 123, pl. LI, 21, 22.

¹² *Archaeologia*, LXXXV (1936), 252.

SECOND FIXED POINT IN CHRONOLOGY OF HARAPPA CULTURE

form were, however, fortunately preserved, and the relevant results are shown in the appended Table.

The apparatus used and an explanation of this method of analysis was contributed by Dr Ritchie to their paper on 'Far Eastern glass: some Western origins' by C. G. Seligman and H. C. Beck (13), and in which the method would appear to have been used for the first time for archaeological purposes (14). In Dr Ritchie's words 'The results are presented on a very roughly quantitative, as well as an accurately qualitative basis. In the table, L indicates a *large amount* of the element ('raies ultimes' very strong, and many other arc lines present), M indicates a *moderate amount* of the element ('raies ultimes' distinct, and a few other arc lines present), T indicates a *trace* of the element (spectrum practically confined to faint 'raies ultimes'), and O indicates that the element is absent, or present only in infinitesimal amount. While accurate figures cannot, of course, be assigned to these results, it may be taken that L indicates quantities of the order of 30 per cent, M of the order of 10 per cent, and T of the order of 1 per cent or less'.

The table shows the composition of the core of each bead and, where this was possible, that of the glaze also. It will be immediately apparent that the composition of all the beads is not the same. On the one hand actual identity of composition of the Wiltshire and Tell el Amarna specimens indicates an identical source of origin; whereas both the Scottish segmented and quoit specimens, though identical to one another, are dissimilar, which may imply a different source and/or a different date. Further, in general the surface glaze in each case is very similar to that of the corresponding core, which is not really surprising since the former often tends to penetrate the latter.

For the matter in hand we should note the absolute identity between the beads from Harappa and Knossos, whereas that from Ur is dissimilar in that it contains traces of silver, chromium, manganese and nickel. The bead from Tell el Amarna differs only in containing traces of lithium and tin, and less calcium; but whether these latter differences are significant or not further extensions of the work alone can decide.

Now this identity of composition of specimens from Harappa and Knossos can mean only one thing; that they were derived from the same source. Also that Sumer was not implicated other than possibly having acted as a trade or other route over which the beads were passed.

Though not exactly a typical bead of its type, but nevertheless segmented (15), the Minoan bead came from an unimpeachable horizon, from the Temple Repositories at Knossos which contained a rich variety of faience and other objects (16). In noting these beads from the Temple Repositories, Pendlebury observed that the segmented variety showed distinct Egyptian affinities, especially to those of the XVIIIth Dynasty (17). Whilst the deposit is of Middle Minoan III horizon, this apparent affinity with the XVIIIth Dynasty implies a late rather than an early date in that horizon, and we may not be far wrong in suggesting c. 1600 B.C. as the date of the Knossos and Harappa segmented

¹³ Published in *The Bulletin of the Museum of Far Eastern Antiquities*, no. 10, Stockholm, 1938.

¹⁴ See, however, the results of other spectrographic analyses by Dr Ritchie in a paper entitled, 'Spectrographic Studies on Ancient Glass: Chinese glass from pre-Han to T'ang times', *Technical Studies in the Field of Fine Arts*, v (1937), 209; and 'Egyptian Glass, mainly of the 18th Dynasty, with special reference to its cobalt content', M. Farnsworth and P. D. Ritchie, *ibid.*, vi (1938), 154.

¹⁵ *Archaeologia*, LXXXV (1936), pl. LXIX, fig. 2, 9.

¹⁶ J. D. S. Pendlebury, *Archaeology of Crete*, 1939, 165 ff.

¹⁷ *Ibid.*, 173.

beads in question (18), and possibly of other faience beads in the same contexts, many of which are stated to have been found in the superficial layers of Cutting HP xxx (19).

Here then it is suggested we have a second fixed point in the chronology of the Harappa Culture which reinforces Wheeler's and Piggott's deductions. We must of course allow the lapse of some decades for their transference to the Indus, either by a land or sea route ; but we can, it is suggested, assign with confidence a date of *c.* 1550 B.C. for their appearance on these Indus sites, which certainly confirms the generally accepted approximate date for the composition of the Rigveda, and of contact by trade or otherwise with Europe (20).

In conclusion, however, I must emphasize that these spectrograms were derived from single specimens of beads only, though the inclusion of separate determinations, where possible, of core and glaze corroborate one another ; and that the original investigation was in the nature of an exploratory survey of the possibilities of this method of approach. Clearly, verification of the findings and extension of the work is necessary, but there can be little doubt that we have here a most valuable method applicable to archaeological research.

¹⁸ Ibid, 175.

¹⁹ *Ancient India*, no. 3 (1947), 123.

²⁰ See, for instance, H. Peake and H. J. Fleure, *Merchant Venturers in Bronze*, 1931, 124-137.

TABLE
SPECTROGRAPHIC ANALYSES OF BLUE FAIENCE SEGMENTED BEADS

	Na	K	Li	Ca	Ba	Sr	Pb	Bi	Sn	Ag	Cu	Zn	Mg	Fe	Cr	Mn	Al	Si	V	Ti	B	P	As	Sb	Ni	Co	Au	Hg	Cd
Tell el Amarna ..	Glaze	T	O	T	T	O	O	O	T	O	T	O	T	T	O	O	O	L	O	O	O	O	O	O	O	O	O	O	O
	Core	T	O	T	T	O	O	O	T	O	T	O	T	T	O	O	T	L	O	O	O	O	O	O	O	O	O	O	O
Wiltshire ..	Glaze	T	O	T	T	O	O	O	O	O	T	O	T	T	O	O	T	L	O	O	O	O	O	O	O	O	O	O	O
	Core	T	O	T	T	O	O	O	T	O	T	O	T	T	O	O	O	L	T?	O	O	O	O	O	O	O	O	O	O
Scotland ..	Core	T/M	T	O	T/M	O	T	O	T/M	O	T	O	T	T	O	T	T	L	T	O	O	O	O	O	O	O	O	O	O
	Core	T/M	T	O	T/M	O	T	O	T/M	O	T	O	T	T	O	T	T	L	T	T	O	O	O	O	O	O	O	O	O
Knossos ..	Core	T	O	O	T/M	O	O	O	O	O	T	O	T	T	O	O	T	L	T	O	O	O	O	O	O	O	O	O	O
	Glaze	T	O	T/M	O	T/M	O	T	O	O	T	O	T	T	O	O	T/M	L	T	T	O	O	O	O	O	O	O	O	O
Harappa ..	Core	T	O	O	T/M	O	O	O	O	O	T	O	T	T	O	O	T	L	T	O	O	O	O	O	O	O	O	O	O
	Glaze	T	O	O	T/M	O	T	O	T	T	T	O	T	T	O	O	T	L	O	O	O	O	O	O	O	O	O	O	O
Ur ..	Core	T	O	O	T/M	O	O	O	O	T	T	O	T	T	O	T	T	L	O	O	O	O	O	O	O	O	O	O	O

L = of the order of 30 per cent or over.
 M = of the order of 1-10 per cent.
 T = of the order of 1 per cent or less.
 O = not detected.

Important New Books and Articles

The inclusion of a book in this list does not preclude its subsequent review

- THE FOUNDERS OF THE ZIMBABWE CIVILIZATION, by G. A. WAINWRIGHT. *Man*, June, 1949, No. 80 (Vol. XLIX, 62-6). [The author attempts to prove, from archaeological and documentary evidence (Mas'udi) that Zimbabwe was founded in the 9th or 10th century A.D. by Gallas migrating southwards from the Harar region of Ethiopia, where they had learnt to build in stone].
- A HUNDRED YEARS OF WELSH ARCHAEOLOGY: centenary volume of the Cambrian Archaeological Association, edited by V. E. NASH-WILLIAMS. John Bellows Ltd., Gloucester, 1949. 21s (postage 6d). [An admirable up-to-date outline of Welsh early history: prehistoric period, 56 pages, by W. F. GRIMES: Roman period, 25 pages, by H. J. RANDALL: early Christian and medieval, two parts each, 43 pages: good index, many illustrations].
- RIDGE AND FURROW AND THE OPEN FIELDS, by M. W. BERESFORD. *Economic History Review* 2 Ser. Vol. 1, No. 1, 1948, 34-45 [Shows by a correlation of air-photos and old cadastral plans that the ridged fields so common in the Midlands are simply the intact 'fossilized' remains of the medieval field-system, and emphasizes the need for historical field-work].
- THE WESTERN GREEKS: the history of S. Italy and Sicily from the foundation of the Greek colonies to 480 B.C., by T. L. DUNBABIN. Oxford University Press, 1948.
- BRITISH ARCHAEOLOGY: a book-list for teachers. Council for British Archaeology, c/o Inst. of Arch., Inner Circle, Regents Park, N.W.1. 1s 6d. [Indispensable authoritative guide to the best that has been written on all aspects, from the Old Stone Age to the Industrial Revolution].
- BRITONS, ROMANS AND SAXONS ROUND SALISBURY AND IN CRANBORNE CHASE, by C. F. C. HAWKES. *Arch. Journal* CIV, 1948, 27-81. [A masterly account of General Pitt-Rivers' excavations; by using the General's own evidence, interpreted in the light of 50 years' archaeological progress, Professor Hawkes is able to reach new and important conclusions. He pays homage to the genius of the General whose methods made it possible to achieve this].
- THE PREHISTORIC AND ROMAN REMAINS OF FLINTSHIRE, by ELLIS DAVIES: published by the author at Whitford Vicarage, Holywell, Flintshire. £1 1s od. [A companion volume to the author's *Denbighshire*, published 20 years ago, and as valuable. It gives a complete descriptive list of everything in the county, and will be of the greatest use to all future students. One wishes that similar compilations could be made of every county].
- FOSSATUM AFRICAE: vue aerienne de l'organisation romain dans le sud algerienne, par J. BARADEZ. Arts et Metiers graphiques, 18 rue Seguiet, Paris 6°. [An air-survey copiously illustrated of Roman roads, forts and fields].

Notes and News

A MESOLITHIC HABITATION-SITE IN YORKSHIRE

A site of outstanding importance has been excavated this summer at Star Carr, Seamer, a few miles S. of Scarborough, by Dr Grahame Clark, who has kindly contributed the following :—

Excavations, carried out this summer with the support of the Prehistoric Society and of the Department of Archaeology and Anthropology of Cambridge University in the Vale of Pickering, Yorkshire, have revealed what promises to be the richest Maglemosian station ever found. Credit for revealing the possibilities of the Flixton area belongs to Mr John W. Moore, who first discovered Maglemosian flints and then succeeded in tracing them to their parent deposits. The site chosen for excavation on a more extensive scale was chosen with the explicit aim of recovering traces of the fauna on which the Maglemosians lived and as wide a range as possible of their material culture, including objects made from substances normally lost to archaeology through decay. Aided by the exceptionally low level of the water, the excavators, comprising a party from Cambridge, supported by helpers from the Scarborough region, were able in just under four weeks to examine approximately 500 square feet of the mesolithic level which was sealed by several feet of peat of early post-glacial age. From this single cutting, which exhausts only a small fraction of the site, around ten times as many 'harpoons' of Maglemosian type as have hitherto been found in this country were recovered, together with numerous other objects made from antler, a few from bone, a flint industry in mint condition, small stone beads of unique type, red ochre, amber ornaments and numerous tightly rolled spools of birch bark, resembling those from the Swiss lake villages and from the recent folk culture of the Alpine and Scandinavian areas. It may be added that some of our 'harpoons' are over a foot in length.

For the first time a substantial fauna has been recovered. According to a preliminary report by Dr F. C. Fraser and Miss D. E. King of the British Museum (Nat. Hist.), red deer with antlers much more powerfully developed than those of deer still extant in these islands abounded, but elk, roe deer and large ox were also common; young beavers were present in numbers and badger, marten and fox were also represented. It is of great interest that many of the deer antlers had been utilised to provide material for implements and that the technique of removing splinters by means of flint burins should resemble closely that practised by the Hamburgian reindeer hunters of Meiendorf. One of the unexplained features of the find is the presence of a series of male deer frontlets having the stumps of the antlers carefully shaped and the parietal bones perforated in three places. Among the flint implements burins are indeed the commonest type, though microliths and scrapers are common, and small, poorly made core axes are present.

Of even greater interest were the indications of a stabilizing of the surface of the gravel ridge on which the people lived, consisting of a mat-work of birch stems, antlers and brushwood. Further investigation of this feature, which may throw light on the early origin of crannogs and kindred structures, is very greatly needed. It is also important to obtain a wider range of the Maglemosian equipment and to take advantage of the exceptional conditions of preservation offered by the site. It may be mentioned

that birch leaves at the archaeological level were perfectly preserved when discovered and that the fungi adhering to the birch stems were still intact. Samples of the peat were collected by Dr H. Godwin, F.R.S. and by one of his research assistants on the site and it is hoped that analysis of these in the new Sub-department of Quaternary Research at Cambridge should enable the ecological context of the occupation to be securely fixed.

EXCAVATIONS ON BLEWBURTON HILL, BERKS*

Three seasons' work (1947-9) on this hill-fort have proved both its existence (which had been doubted†, though on quite inadequate grounds) and age. An account of the first season's work, written by Mr A. E. P. Collins, is published in the *Berkshire Archaeological Journal* (1); for notes on the results of 1948 and 1949 we are indebted to Mr W. A. Smallcombe, Curator of the Reading Museum, which, together with the Berkshire Archaeological Society, was responsible for the work throughout.

Blewbarton Hill is a whale-backed outlier composed of Lower Chalk, and is separated from the main escarpment of the Berkshire Downs to the south by a narrow strip of Upper Greensand. It lies between the villages of Blewbury on the west and Aston Upthorpe on the east, whose parish boundary passes right through the middle of the hill-fort. This boundary is of Anglo-Saxon age and the hill was called *Bleobyrig dun* in A.D. 964 (2), showing that the modern form is corrupt and should properly be Blewburdon. The first element is O.E. *bleo*, colour, used adjectivally. The same combination occurs in the name of Bleadon in Somerset, and is explained by Ekwall as descriptive of the variegated appearance of the hill, caused either by its vegetation or soil or by both. If, as is probable, the hill was already under plough when the name was given, the hill would be conspicuous by reason of its creamy white chalk soil, contrasting with the duller hue of the surrounding plain. Cholsey Hill, 2 miles to the N.E., is a similar chalk outlier whose upper part, as seen from the train, has just this creamy white appearance (3). The Icknield Way, certainly a prehistoric road, passes half a mile to the south.

A feature of geological interest is the capping of hard ochreous gravel containing quartzite pebbles derived ultimately from the Triassic Bunter sandstone, whose nearest outcrop is now near Birmingham. A scattering of these pebbles is found also on the spurs of the main chalk ridge 3 miles to the SSE, west of the Thames between Moulsoford and Streatley. They are regarded as of fluvio-glacial origin, and show that the great ice-sheet of the maximum glaciation extended at least its influence beyond the present Thames valley. Such 'erratic' pebbles are exceedingly rare elsewhere south of the Thames, if indeed they occur at all.

Blewburton Hill is a familiar landmark to all those who rambled over this pleasant vale before it was invaded by the scientists of Harwell, the gravel-merchants of Dorchester

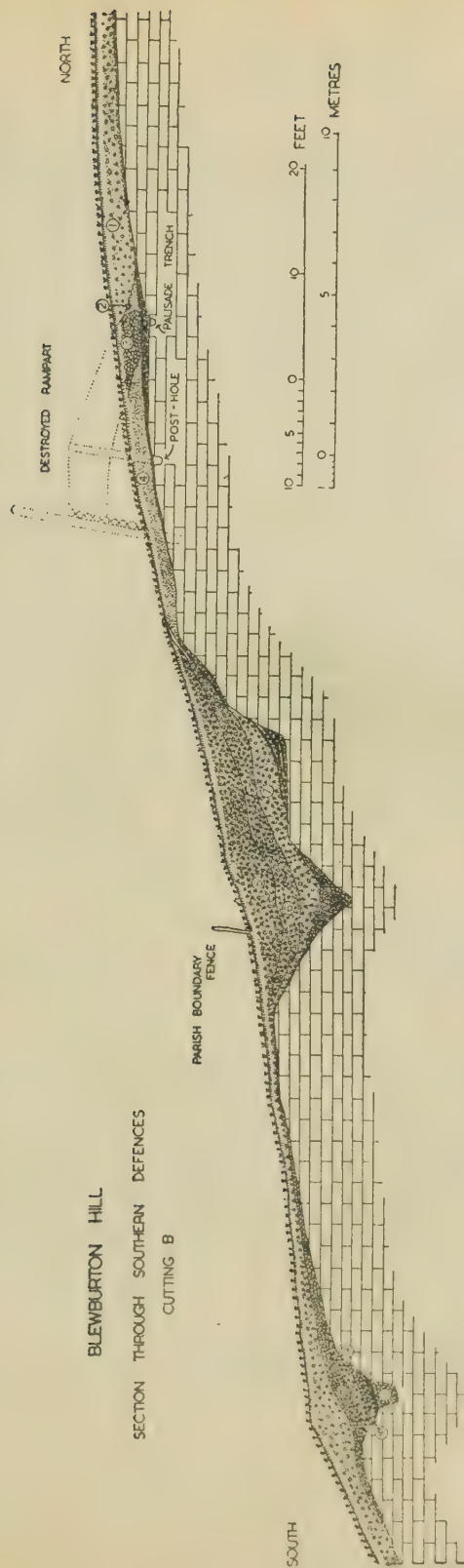
* The section (p. 209) is reproduced from the Report by kind permission of the Berkshire Arch. Society and Mr Collins.

† H. J. E. Peake: Presidential address to the Newbury District Field Club, 28 Jan. 1933: *Transactions*, 1930-3, 219-27.

¹ Published by the Berkshire Archaeological Society and printed by Messrs Lamport Gilbert and Co., 3 and 4 Gun St., Reading: vol. 50 (for 1947), 4-29.

² Birch, *Cartularium Saxonicum*, no. 1143.

³ It is worth recording that there may have been another hill-fort on a spur of the downs called on an old map Silsbury Hill, 1 mile S. of Cholsey, if the second element is O.E. *burh* (as it should be) and not O.E. *beorh*, barrow.



Section through southern defences, Cuttings A and B. Key to Stratification :

1. Plough soil full of chalk fragments and flint and quartzite pebbles
2. Loose, dark 'occupation earth' containing AB sherds, etc.
3. (near 'rubble' rampart) capping
4. Loose black soil containing A sherds, etc.
5. Light brown plough soil full of chalk fragments
6. Darker plough soil with chalk fragments
7. Brown plough soil with many chalk fragments
8. Compact angular chalk rubble
9. Yellowish soil with chalk fragments
10. Large chalk fragments in yellowish soil
11. Loose chalk rubble

Turf-lines are shown in solid black

and the aviators of Culham. Its chief feature is the series of step-like terraces or strip-lynchets formed on its slopes by centuries of cultivation during the Middle Ages. These have obliterated all outward signs of the rampart and ditch; but from the encircling plan they follow there could be little doubt that (as the Old English name showed) there was once a hill-fort there. Similar strip-cultivation penetrated and masked the defences of other hill-forts, such as Battlesbury (above Edington, Wilts) and Credenton Hill (near Banbury) (4).

The presence of a hill-fort on Blewburton Hill was proved during the first season. Not even centuries of ploughing had completely levelled the rampart, whose inner facing of hard chalk rubble, $3\frac{1}{2}$ feet thick, was found. Beyond this (outwards) was a layer, 2 feet thick, of loose black rampart soil where the burrowing of rabbits had destroyed all stratification. The rampart rested on a 'continuous black rather greasy layer' representing the turf-line of the old surface upon which it had been built. This black layer ran *unbroken* over a small trench $1\frac{1}{2}$ feet deep and 1 foot wide; which had once held a wooden Palisade. It is clear, therefore, that, before the rampart was constructed, the occupants of the hill had erected round it this wooden defence, and that between the making of this and of the rampart, enough time had elapsed for the Palisade to decay, the trench to fill up and the turf to grow over it again as before. The finds showed that the first, or Palisade, period was associated with pottery of Iron Age A type, and the second, or Rampart, period with pottery of Iron Age AB type. The central date is about 250 B.C. according to the Hawkes' chronology now generally accepted, so that we may date the first period about 400-250 B.C. and the second after 250 B.C., but very soon afterwards, continuing to perhaps about 100 B.C. (5). Beyond the rampart was the main ditch (38 feet wide and $10\frac{1}{2}$ feet deep) whose section was curiously abnormal, having a broad step on the inner scarp-face. This feature occurred also at Bury Hill, Hants, excavated by Professor Hawkes (6), and may on both sites have been merely an adaptation to natural conditions (a fissure in the chalk). Beyond the main ditch again, at a distance of 30 feet, was another ditch (9 feet wide and not less than 9 feet deep). The first of these two ditches obviously belonged to the rampart behind it, but the second could not be dated.

Within the area of the hill-fort were found several pits and post-holes dated by finds exclusively to the first (Palisade) period.

The finds included remains of both saddle and rotary querns, a bronze finger-ring of unique type and the usual collection of stone, bone and horn objects. The ring was the only metal object found.

Summing up the results of the first year's excavation, Mr Collins concluded that the first settlers belonged culturally to the Wessex A province, as indeed the haematite-coated bowls prove. Historically, it was this lovely burnished ware, often bright red in colour and pleasant to handle, that first attracted the attention of archaeologists, surprised and pleased to find such nice stuff instead of the uncouth food-vessels and collared urns of the barrows. It is now of course well known, but its recognition falls well within the archaeological memory of the present writer. It is the mark of our earliest Iron Age culture, and the Blewburton 'A' people who shared it seem (for reasons given in the report)

⁴ The existence of a hill-fort here is inferential only, but judging from the late Major Allen's air-photograph the inference is fully justified.

⁵ Except for the last these absolute dates are not specifically mentioned in the Report, but are inserted here by the writer for expository purposes only.

⁶ *Proc. Hants. Field Club*, xiv, 291-337.

to have belonged to a rather late phase—if one put it between about 350 and 250 B.C. one would probably not be far out.

The succeeding AB culture is so called because it represents a modification of A by the bearers of the B. culture. This was introduced by Marnian invaders round about 250 B.C., and it was presumably the situation so created that made the Blewburton people make a rampart round the hill. In this they were doing what most of the other hill-folk had already done in the 'war scare' of the invasion, e.g. at Quarley and Little Woodbury, where palisades were superseded by ramparts, and at Ladle Hill where (probably, for it has not been excavated) a hill-fort was then begun but never finished. The preventive measures taken appear to have been successful, for the Marnian invaders veered off and their chief settlement-areas (of the B culture) are in the east and northeast. One group, the Parisii (from the Paris region) settled in Yorkshire where they introduced the chariot-burials characteristic of the Marne district.

The conclusions drawn from the first year's work seem to have been confirmed by the later excavations, except that the big (inner) ditch was proved to have two periods. The main entrance, on the sw side, was explored, and the road leading into it was found to have a rough cobbled surface of Bunter pebbles; at some later date this road had been narrowed by building on either side of it a wall of dry stone, formed of coral rag (limestone) whose nearest natural outcrop is at Marcham, 9 miles away to the NW, near Abingdon. Similar limestone blocks were also found beside the road (but on one side only) at Buckland Rings (7), just before reaching the main gate. At Blewburton the post-holes of the main gateway have been found, and are remarkable for having held *half-trees*, not the whole trunk; they were several feet in diameter and depth.

A trench dug from inside through the rampart and on through the strip-lynchets on the west seems to have shown that the latter were medieval. Saxon burials were found within the rampart; it would be most interesting if these graves could somehow be related stratigraphically to the strip-lynchets. 'In the section through the main ditch outside the rampart . . . we unearthed a man, pony, dog, iron adze and pot', all associated and of Iron Age A.

We have given a rather lengthy summary of these excavations not because the site is necessarily any more important than many others, but because they are in many ways typical of the sort of work that is going on quietly all over the country, and because the site is easily accessible and probably well known to many readers already. We would like to add another reason, that the report published—itself admirably succinct and lucid and well illustrated—shows that the work is being well and truly done.

EARTHWORK AT OLD YEVERING, NORTHUMBERLAND

One of the chief incidents in the introduction of Christianity to Northumbria was the stay of Paulinus at King Edwin's 'villa regia' of Adgefrin about A.D. 630 (1). The identification of Adgefrin with Yevering seems never to have been doubted, but no convincing suggestion has yet been made as to the actual site of Edwin's 'villa'. Certainty is impossible without excavation, but the claim of the structure described in this note (2) seems strong. The arguments in its favour are set out below.

¹ *Proc. Hants. Field Club*, XIII, 150, plate VI, 1.

¹ Bede, *Hist. Ecc.*, ch. XIV.

² 15 SE 2 in the New List of Native Sites in Northumberland *Proc. Soc. Ant.*, Newcastle, 4 ser., vol. XI, no. 4, 1947, pp. 140-79. There called North Yevering.

ANTIQUITY

The remains lie on the steep northern slope of Yevering Bell, a hill crowned by the largest native 'fort' in Northumberland. Just above the site, the bare scree of the higher slopes gives way to grass and bracken, and the slope of the hillside decreases to one in three. The 500 foot contour line passes through the area, the lower boundary of which is at present roughly coincident with a modern wall which forms the upper limit of cultivated land. The adjacent parts of this wall contain particularly large stones, apparently derived from the structure, which seems to have been extensively robbed. Some of the walls seem also to have been obscured by soil creep down the steep hillside.

The central feature is an enclosure about 100 feet square surrounded by a wall about 8 feet thick. The interior has been levelled by cutting into the hillside, and shows faint traces of heavily robbed buildings. Surrounding this is an outer square enclosure, of about 160 feet side, formed by a slighter but still substantially built wall. This is now visible only for part of its circuit, but it appears probable that it originally formed a complete square. Small terraced areas occur in the space between this and the inner wall at the south-east and south-west corners, and perhaps at the north-east corner also.

Two further walls surround the site, but these are generally of slight construction, being only 2 or 3 feet wide. Wall 3, counting outwards from the centre, encloses a roughly rectangular area about 250 feet by 180 feet, the central feature being placed rather to the west of its centre. The space on the eastern side of the central feature, between walls 2 and 3 and below the 510 foot form line, has been partly levelled but the slope is still considerable.

The space enclosed by the outermost wall is even less accurately rectangular, about 400 feet by 250 feet, and once again extends further to the east of the central structure than to the west. There is another partly terraced area between this wall and wall 3, at the west end of the enclosure and below the 510 foot form line. The wall along the upper edge of the outer enclosure is more substantial, but does not extend for the whole length from east to west. At its eastern end its line is interrupted by some traces of walls which appear also to have extended above the 540 foot form line to the foot of the scree, but which are so slight, ruined, and obscured by stones fallen from the hillside, that the plan cannot be worked out.

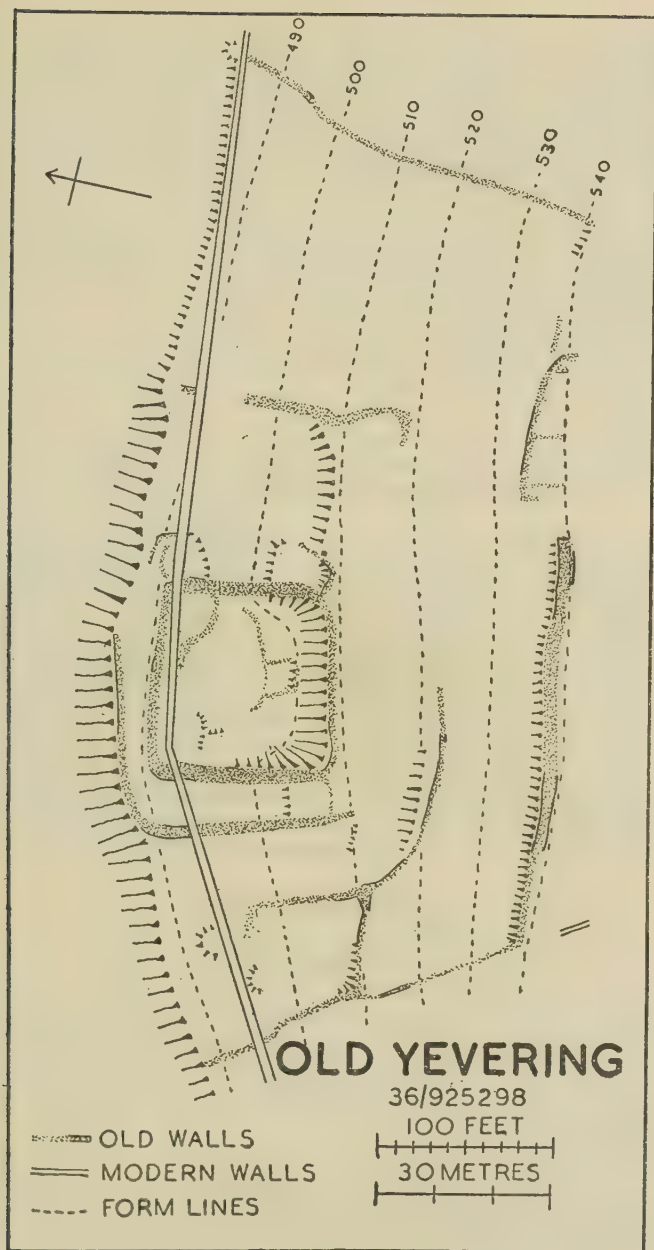
Walls 3 and 4 at present end on a negative lynchet which forms the upper limit of former cultivation, but in certain lights traces of what may be their continuation below this limit (3) are visible from the other side of the valley. It is possible, therefore, that the outer enclosures were also more nearly square in plan, and that the whole site was roughly symmetrical about its east-west axis.

The site has features which mark it out as distinct from the typical native homestead of the area. These latter are almost invariably terraced in this part of the Cheviots but the enclosed area usually lies at two levels, the upper carrying the huts, the lower presumably being a yard for cattle (4). Further, they are oval in plan, and concentric systems of walling do not seem to occur.

The site described is distinguished from these by the fact that each terraced area has been levelled to a single plane, the plan is essentially rectangular in outline, and the site is surrounded by four roughly concentric walls. It should be emphasized, however, that it is quite indefensible, and the walls can have served for no other purposes than as field boundaries or protection for cattle.

³ I am indebted to Sir Walter de L. Aitchison for this observation.

⁴ The recently published homesteads at Crock Cleugh, Roxburghshire, are typical. *P.S.A.*, Scot., LXXXI (1949), pp. 138-57.



The claim that the site may be identified with the 'villa regia' of Adgefrin must now be considered. It is evident from Bede's account that this must be sought for on the northern slopes of the Cheviots, within reach of the River Glen, and somewhere within the neighbourhood of Yeving. It is possible that the modern village of Yeving covers the site, but the name Old Yeving does seem to imply some traditional recognition that an earlier centre of occupation was located somewhere near the site described. The 'traditional' identification of a medieval cottage about 430 yards north of the site with 'King Edwin's Palace' (5) should perhaps be discounted as an antiquarian fiction, but if accepted as genuine it provides strong support for the suggestion made here. It appears highly unlikely that the fort on Yeving Bell was occupied by Edwin. All the internal structures are circular, and excavations during the last century produced no relics later than the Roman period.

Turning to the site itself, its superficial appearance suggests that the labourers engaged on the work were familiar with the native technique of terracing into hillsides, whereas the designer responsible for the general plan seems to have been attempting something barbarically reminiscent of Roman layout. It may be noted that King Edwin used to have carried before him a standard, or *tufa*, apparently in imitation of Roman emperors (6). The character of the site is therefore not inconsistent with the identification proposed.

Final certainty can only be attained by excavation, but if this is indeed King Edwin's 'villa' it is an example, perhaps unique in this country, of a 7th century royal dwelling, on a site undisturbed either by later or by earlier occupation. As such, it is hard to overestimate its interest and importance.

A. H. A. HOGG.

SIXTH INTERNATIONAL CONGRESS FOR THE HISTORY OF SCIENCE

The Union Internationale d'Histoire des Sciences and the Académie Internationale d'Histoire des Sciences have agreed to ask the Dutch branch of the Union, the Genootschap voor Geschiedenis van Wiskunde, Geneeskunde en Natuurwetenschappen, to organize the Sixth International Congress for the History of Science in Holland.

This congress will take place August 14th to 20th, 1950, in Amsterdam University. Apart from general and committee meetings, the congress members will meet in four sections:

- (a) History of mathematics, physics and astronomy
- (b) History of chemistry, pharmacy and biology
- (c) History of applied science and technology
- (d) History of medicine.

The meetings of the last section will also form the Congress of the Union Internationale d'Histoire de la Médecine, which will plan the programme of this section. All papers to be read at this Congress should reach the secretary before May 1, 1950, and should be accompanied by a summary of 100-150 words. *After May 1st no further papers will be accepted.*

Further circulars will contain details on registration, payments, accommodation, entertainments, excursions, programme, etc. Provision will be made to entertain ladies or relatives accompanying members. The registration fee of fl.25.- (or the equivalent in other currency) for each member (fl.15.-, or the equivalent in other currency for each

⁵ See for example W. W. Tomlinson. *Comprehensive Guide to Northumberland*, p. 504 (11th ed.).

⁶ Bede, *Hist. Ecc.*, ch. xvi.

of his guests) will cover the expenses of transactions of the Congress, transportation and light refreshments during the Congress as well as the final dinner. Hotel accommodation can be provided for fl.7.50.-fl.12.50 including breakfast; the daily general expenses need not exceed fl.25.- or the equivalent in other currencies.

Letters of registration, enquiries and suggestions should be addressed to the Secretary of the Congress : Prof. R. J. Forbes, Haringvlietstraat 1, Amsterdam-Zuid, The Netherlands.

‘ VASES SUPPORTS ’

The *vases supports* of the French and Channel Island neolithic and megalithic cultures have been the subject of study and review by Mrs J. Hawkes (*Archaeology of the Channel Islands*, vol. II, The Bailiwick of Jersey, 1939, 72). Whilst distinguishing

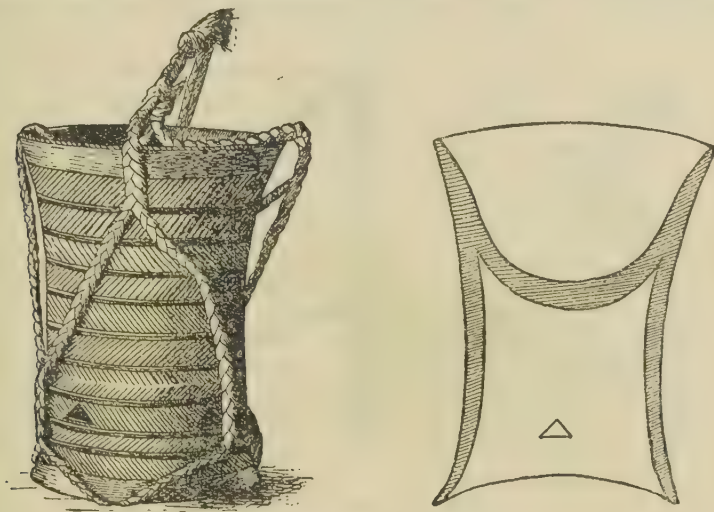


FIG. 1. VESSEL USED IN FUMIGATING SKINS, FROM VICTORIA NYANZA (4)

between the saucer and tubular types she points out that their function cannot have been the same throughout the whole area, the tubular type being predominant in the east at such camps as Chassey and Harrouard, where they were presumably used mainly for the domestic purpose of supporting round bottomed pots. In Brittany and Jersey on the other hand the saucer type is clearly associated with the megalithic complex and in that context has been interpreted as having been used for some such ritualistic use as a lamp or to receive ritual offerings. In support of this suggestion Mrs Hawkes has drawn attention to certain *vases supports* from Hougue Bie which were undoubtedly charred on the upper surface of the saucer.

The purpose of this note is to draw attention to another possible use for such objects. Whilst recognizing the danger of drawing too close an analogy from the equipment of comparatively modern African natives the resemblance of these saucer *vases supports* to the clay vessels used for fumigating skins by certain Kisiba tribes of the Victoria Nyanza appears to be close enough to warrant notice. Paul Kollman in his description of the region (*The Victoria Nyanza*, 1899, 91) states that ‘ there is an interesting vessel

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of black baked clay ornamented with neat line patterns. It is 8 inches high, and consists of two divisions as may be seen in the diagram of a section [Fig. 1]. In the upper part, which is cup-shaped, are placed bits of wood soaked in grease, with lighted shavings. The whole is then placed underneath a hide stretched out for drying, so that the smoke generated may cause the hide to lose its smell more quickly. The natives call the contrivance *kishwa* '.

Comparison of the illustration of this African vessel (Fig. 1) with those illustrated by Mrs Hawkes from Jersey is striking, especially those from the Dolmen des Géonnais (Fig. 2a) and from Le Pouquelaye de Faldonet (*op. cit.* 227 and 235). But in certain respects some of the vessels illustrated by Le Rouzic from Er-Lannic bear an even closer resemblance (*Les Cromlechs de Er-Lannic*, 1930, nos. 1, 44, 50, etc.). Leaving aside the matter of ornament which could hardly be expected to be the same at periods so remote chronologically, one is immediately struck by the identical shape and position of the

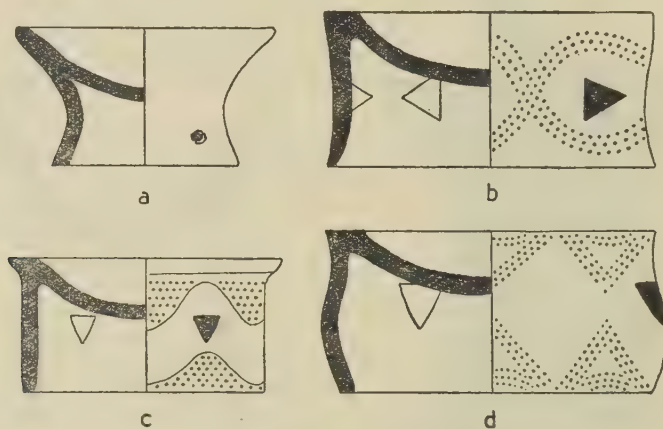


FIG. 2. 'VASES SUPPORTS'

(a) from Dolmen des Géonnais *after* Mrs Hawkes, (b, c and d) from Er-Lannic *after* Le Rouzic (4)

triangular perforations in the lower half of some of them (Fig. 2b, c and d). The object of these holes, or for that matter the simpler perforations so frequently encountered in the saucer type of *vases supports*, is not immediately apparent. As they cannot have contributed in any way to form a draught in the upper compartment we must presume that they were added to act as an escape for the heated air beneath, which otherwise would in certain circumstances have built up sufficient pressure to cause the support to move or even topple over. In any event it is now difficult to surmise why such comparatively complicated triangular excisions should have been adopted in preference to simple perforations. And to find a virtually identical technique practised some 4000 years later makes the matter even more surprising.

Such curious vessels may have had an independent origin, but the number of characters they possess in common suggests that they were invented for the same or a closely allied purpose. At present, however, we cannot be too sure of an independent origin in view of the very probable North African derivation of the West European neolithic culture, and the strength of tradition.

J. F. S. STONE.

EXCAVATIONS AT WHITHORN

MR RALEGH RADFORD writes :—At the suggestion of the Society of Antiquaries of Scotland and the Dumfriesshire and Galloway Natural History and Antiquarian Society the Ministry of Works has begun excavations at Whithorn. The roofless nave and the eastern part of the medieval church, which stand in a large modern churchyard, have long been under the care of the Ministry, which is also Guardian of the Chapel on the Isle of Whithorn and the Cave at Glasserton, the two other sites traditionally associated with Saint Ninian.

Excavation was first directed to the nave of the Priory Church and revealed interesting data concerning the history and development of this building, the earliest part of which goes back to the middle of the 12th century. The interior, which had been disturbed in medieval and modern times, yielded no trace of any remains earlier than the 12th century. Attention was next given to the east end of the Priory Church, where ancient structures were uncovered by the Marquess of Bute at the end of the 19th century. Two buildings were represented by dwarf walls carried up 1 foot above the surface in frankly modern masonry. As no record of the character of the walls was available, it was thought desirable to reopen the excavations made by Lord Bute. The northern of the two groups of walls proved to be of late medieval date and probably formed part of the Infirmary of the Priory. The other building lay at the east end of the church and the walls had been cut through by the foundations of the crypt, a building erected about 1200 and forming part of an extension of the Romanesque church carried out in the early 13th century. The three older walls formed part of a small rectangular building which measured internally 16 feet wide and over 14 feet long. The levels shewed that the western end had been entirely destroyed when the crypt was erected. The walls were 4 feet wide and stood to a maximum height of 3 ft. The masonry was of local stone, roughly split into large irregular blocks and set in clay. The external face was usually formed by a natural line of cleavage along one of the bedding planes of the rock. Small stones were used to trig the larger blocks into position. The lowest courses of the south and east walls were undisturbed. The next courses appeared to be original but some of the stones had been moved slightly ; this may have been due either to removal and replacement at the time of the 19th century excavations or to earlier disturbance. Above these courses was modern masonry with roughly dressed stones set in mortar and clearly dating from the 19th century. The north wall had been entirely demolished at that time. The site was then used for a pit in which the bones found in the course of the excavation were buried and the wall roughly rebuilt out of the original material. It soon became clear that the walls had been explored by trenches driven along the face. These trenches contained stones, rubbish and a certain amount of mortar, very similar to that used in the 19th century walling. On the east face it was found that the trench stopped 6 inches above the base of the old wall and on removing the undisturbed soil the same mortar was found *in situ*, daubed on to the outer face of early masonry. No similar evidence was available for the inner face of the wall and old mortar was not found within the building. The evidence therefore points to a dry built structure the outer face of which was plastered with a pale cream coloured mortar. The date of the building is demonstrably earlier than 1200 but the archaeological evidence does not give any further clue to its date.

Excavations were also carried out within the Chapel of St. Ninian on the Isle of Whithorn. A small fragment of masonry earlier than the 13th century walls was found near the east end of the building, but the whole site had been so badly disturbed in modern times that no conclusions were possible. Trial excavations carried out in 1948 had

demonstrated that the appearance of rectangular structures noted on the summit of the island, north of the chapel, was in part caused by natural ridges of rock and in part by tipping of debris; this probably came from the chapel as a fragment of late medieval pottery was found under the spread of rubble. It should further be recalled that no crosses, comparable with the early series from Whithorn itself and from St. Ninian's Cave, have been found on the Isle.

Technical considerations shew that the early building discovered at Whithorn is not of the period of Anglian supremacy (7th–9th century) and suggest that it is unlikely to be of the later period when there was a flourishing school of stone carving on the site. The remains inevitably recall Bede's description of *Candida Casa* with its church of stone, where St. Ninian, a Bishop of the Britons, lay (*Hist. Eccl.* III, 4). The date of this Saint, who is credited with the conversion of the southern Picts, is obscure. Opinion has tended to concentrate on the story of his visit to St. Martin (ob. 397) at Tours. But this is first recorded in the 12th century life by St. Ailred; the 8th century *Miracula Nynie*, a Whithorn production, knows nothing of the story and as Dr Levison has pointed out it is unthinkable that the poet would have omitted a personal link with the celebrated Bishop of Tours, if he had found it in his source (*ANT.*, XIV, 287). There is however another indication in the story common both to the Life by St. Ailred and the *Miracula*, and so probably taken from the lost earlier life which both use. This is the episode of the blinding and subsequent healing by the saint of King Tudwal. Chadwick (*Anc. Scotland*, 146) has pointed out that the fourth genealogy in Harleian 3859 probably belonged to Galloway. Merfyn Mawr, the only datable member of this family, was killed in 681, according to the Annals of Ulster. Reckoning 30 years to a generation this would give a date about 450 for the first Tudwal in this family (Jesus College 20 suggests that one generation may have fallen out of the Harleian pedigree, and this has been allowed for). This date coincides with the period to which the earliest inscription, at Whithorn, the Latinus stone, should be ascribed. It is also conformable to the sources used by Bede, which dated St. Ninian considerably earlier than St. Columba, while the presence of Christians in the western Lowlands at this date is confirmed by the Epistle of St. Patrick to King Ceretic.

LONG BARROW NEAR PITSFORD, NORTHANTS

This tumulus* was first recognized as a long barrow by William Stukeley in 1724. In his *Itinerarium Curiosum* he mentions a 'long barrow at Pesford called Longman's Hill (1)'. Previously, in 1712, the Rev. John Morton had written, 'The Hill called Longman's Hill nearer the town of Pisford by the Northampton Road, being of an oblong shape about ten yards wide and not encompassed with a ditch I incline to think was a tumulus or Sepulchral Hill, till I hear of a likelier account of it . . . (2)'.

Among the papers of Sir Henry Dryden in the Northampton Public Library is an account of a 'Roman Tumulus' situated in Brampton Lane, Pitsford, which was investigated in August 1882. It is stated that 'Roman' urns and a spearhead were found in an area ninety by twenty feet but no further information about the area is given, nor of the depth at which the objects were found. In view of the measurements, however, it is possible that the tumulus is the one described by Morton and Stukeley.

* National Grid 752/678, one-inch o.s. 1946, no. 133.

¹ *Itin. Cur.*, 1724, p. 35.

² Morton's *Nat. Hist. Northants.*, 1712, p. 548.

The tumulus has been marked on Ordnance Survey maps of Northamptonshire since the first edition of the one-inch map in 1815. On a map published in 1854 the site is marked as Lyman's Hill (3).

The site was visited on June 26th, 1948. The mound is situated four miles north of Northampton, about a hundred yards along the lane leading to the village of Pitsford from the main road from Northampton to Market Harborough. It is on the north side of the lane, and is at present fenced off. A number of modern houses flank the ends of the barrow, and there are also a few on the north side. A hedge at the side of the roadway cuts into the barrow on the south side.

The countryside is undulating and comparatively open, and the mound itself is about 350 feet above sea-level. The geological formation is that of the Inferior Oolite. At the time when the barrow was built the climate was probably considerably wetter than at present, and the area may have been more wooded. The water-supply would have been plentiful, as two streams, one flowing to the north of the site and another to the south, converge at a point about a mile and a half to the west of the spur on which the barrow is built. There are numerous springs in the district, and according to Morton, about 200 years ago there were 300 springs in the 1200 acres of Pitsford field.

Detailed measurements could not be obtained as the mound is planted with trees (4). The mound is oblong, measuring about a hundred feet in length and is about thirty feet broad. It is seven to eight feet high at the east end, and five to six feet at the west. The longer axis lies approximately east to west and is roughly parallel to the road. The east end has been disturbed and is spread about. The mound was originally longer, but a farmer is said to have removed a quantity of earth from the east end, and amongst this earth bones were found. It is not known whether the bones were human or not, but a human thigh-bone was picked up on the south side of the barrow: it has since been lost. If the barrow is the one investigated by Sir Henry Dryden, there is nothing to indicate that it was an extensive examination, as the main body of the mound is intact. The south side has, however, been broken into by the hedge. No megalithic features are visible and there are no signs of ditches. At present the mound is fenced off and is in no danger of interference.

It is still known as Lyman's Hill, and there is a local belief that it contains the remains of soldiers killed in the battle of Naseby.

There is every reason to regard this mound as a genuine long barrow, probably of the unchambered type. Although it has been marked as a tumulus on all Ordnance Survey maps since the first edition of the one-inch map of Northamptonshire (1815) it has not been described as a long barrow since William Stukeley, nor is it marked on any map showing the distribution of long barrows.

It cannot be said for certain that it is the same tumulus as that investigated by Sir Henry Dryden. There is no record of any scientific examination, but any bones, urns, etc., which have been found probably belonged to secondary interments.

If this barrow is, in fact, a genuine long barrow it is the first to be noted in Northamptonshire. The nearest unchambered long barrow is the solitary example on Therfield Heath, Royston, excavated by C. W. Phillips (5). A long barrow once existed in

³ *Archaeologia*, vol. 35, p. 394.

⁴ There are various references both to the time when the barrow was planted (e.g. Baker's *Hist. of the County of Northants.*, vol. 1, p. 65) and also to the hedge which has broken into the south side. (*ibid.* p. 65).

⁵ *P.P.S.* 1935, pp. 101-7.

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Dunstable, and another has been claimed on Dunstable Downs (6). Shipley Hill in Leicestershire is another very doubtful example (7). In fact there does not seem to have been any extensive settlement of the midland area by long-barrow building people. The nearest large group of unchambered long barrows is that in Lincolnshire comprising fifteen examples, although there is a very large group of chambered long barrows in the Cotswolds. It may be, however, that an extensive field-survey of Northamptonshire would reveal other long barrows.

JOY FEREDAY.

PINS WITH ANIMAL OR SPIRAL HEADS

In a recent article in *Ancient India* (No. 4, p. 26 and following) Professor Stuart Piggott has discussed the importance of certain pins and a mace-head from Harappa and has traced their distribution from Tepe Sialk near Kashan to Harappa in the South and Mycenae in the West.

I am not concerned here with the mace-head but only with the pins—Professor Piggott points out that the presence of polychrome pottery of the Jamdat Nasr type and of inscribed proto-Elamite tablets would appear to date Sialk IV well back into the 4th millennium B.C. and goes on to say that the pins at Sialk must therefore antedate Cycladic or Trojan examples by at least a thousand years. He is only referring here to the pins with a double-spiral head but it is clear from his later remarks that he must assume a gap of some five hundred years between the Sumerian pins with animal heads and their earliest Western counterparts. Professor Piggott, however, has failed to notice the two bronze pins with bird heads from the first city of Thermi in Mytilene, a city contemporary with Troy Ia and b and therefore to be dated not later than the first quarter of the 3rd millennium B.C. in all probability. Thermi also had the pins with simple spiral heads one from the third city, and one from a mixed deposit. The Thermi pins bridge the chronological gap between the Sumerian and Cycladic pins but stylistically their strong geometric stylization looks more Caucasian than Sumerian.

Other animal-headed pins not noted by Professor Piggott are a bronze one with a head in the form of a sitting dog from Palaikastro dated at earliest perhaps early Minoan III*, and a bone pin found near Eretria and noted by me years ago in the Chalkis museum (museum inventory number 587 and referred to by Dr Lamb, Thermi, p. 166).

These bone pins from the Cyclades and Eretria are of interest in that they perhaps indicate that the whole group including Professor Piggott's animal headed rods were probably used as hair-pins for which no point is necessary, whereas pins required to pierce anything except a woollen garment would presumably require something better than a bone point, or an unpointed rod.

R. W. HUTCHINSON.

⁶ These are Mill Hill, Dunstable (now destroyed; *V.C.H. Beds.*, vol. 1, p. 150; *Arch. J.* 89, p. 174) and Pascombe Pit, which Phillips regards as a pillow-mound (*Arch. J.* 89, p. 150).

⁷ Stukeley's *Itin. Cur.*, p. 102, and Phillips in *Text to Map of Trent Basin*, published by the Ordnance Survey, 1933 (*Megalithic Survey of England and Wales*), p. 7.

* The pin was not stratified and can therefore only be dated stylistically.

Reviews

LIGHT FROM THE ANCIENT PAST: the archaeological background of the Hebrew Christian religion. By JACK FINEGAN. *Printed in the U.S.A. by Princeton University at Princeton, New Jersey.* [London: Geoffrey Cumberlege]. 25s. 1946

IN QUEST OF CIVILIZATION: a search for ancient clues to the modern puzzle. By RONALD LATHAM. *Jarrollds, London.* 21s. *N.d., but preface dated 1946.*

Both these books survey the ancient world, but they do so from very different angles. Mr Finegan's is frankly partisan; his avowed purpose is 'to give a connected account of the archaeological background of the Hebrew-Christian religion'. By judicious selection and omission the birth of Christ is made to appear as that 'one far-off divine event' towards which the combined efforts of mankind had been moving, since the days of the earliest food-producers. Because neither India nor China nor Greece nor the rest of Europe can be shown, even by the most wishful thinker, to have led up to 'the Hebrew-Christian religion', they are therefore disqualified. India has a single short paragraph; China and prehistoric Europe are ignored; and Athens is described, in the chapter 'Following Paul the Traveller', chiefly because it is the place 'where the apostle Paul once stood though but briefly' (p. 272). It is as though a future historian of the Nazi movement should describe Paris as the place where Hitler once stood (though but briefly). Indeed the book is open to many of the same kind of criticisms as those passed on German historical writings published during the Nazi régime, with the qualification that Mr Finegan's purpose is achieved by omission and selection and not by distortion or deliberate mis-statements of fact. Within the limits of its subject the book is both scholarly and up-to-date.

The beginning of 'modern archaeology' is assigned to the year 1798, 'when nearly 100 French scholars and artists accompanied Napoleon on his invasion of Egypt'. That was of course a landmark, but it represented no new development in technique. Inscriptions had been copied and monuments drawn and planned for many centuries before then. The present reviewer once asked the late Professor Sayce when, in his opinion, modern archaeology began, and he replied without a moment's hesitation 'With Schliemann'. That seems for many reasons to be a better view.

But these are trifles. What we object to is that the author should take a large chunk of human history and label it the background of a particular religion (nowhere clearly defined) which at the most prevailed over a very small (and otherwise quite unimportant) part of the whole area surveyed and for a few centuries only at that. It is as if a historian of 'the English-Christian religion' were to summarize the whole of European prehistory and history from the neolithic period down to the Reformation and call it the background of that religion. Has Christianity any more connexion with the builders of the Pyramids than English Protestantism has with the builders of Stonehenge? How can any impartial historian regard the one as, in any sense except perhaps a geographical one, forming part of the background of the other? We are reminded of those meretricious advertisements which display photographs of some famous place or building with expensive vehicles in the foreground.

Mr Latham's is a very different book—balanced, impartial and well written—so impartial indeed that it is often hard to discover what his own views are. Yet for all this

impartiality the style is not arid. The 'book grew out of a course of lectures given . . . at the Working Men's College, St. Pancras, in 1938, and greatly enjoyed by the lecturer'. The author has the happy knack of telling one just what one wants to know about such things as the Egyptian system of writing—a knack unfortunately not possessed by many specialists. The period covered, after a preliminary introduction, is the two thousand years before the birth of Christ. The treatment is selective, divided into a first survey of the world (20th century B.C.) a second survey (6th century B.C.) and the classical age. Within these sections chapters are devoted to the chief centres of civilization. Adequate space is allotted to India, China and Greece. The history of Israel as recorded in the Bible is summarized with a rare and welcome objectivity. A final 'retrospect' of nine pages reveals the author as an original thinker as well as an expositor. There are no references to other than original authorities, and no 'list of books consulted'. But the discerning reader will perceive here and there the influence of some of the best modern authorities, whose writings have been so intelligently assimilated that particular acknowledgments have become superfluous.

The format is adequate but unattractive. Time and space are represented by a rather primitive map at the beginning and a useful chronological table at the end. (A minor point of criticism—on the map the 'Haddendoa' are given undue prominence and are slightly misplaced; they are merely one of many Beja nomad tribes). The illustrations reveal a quiet sense of humour. The frontispiece ('Food-production—the idyllic aspect') shows peasants cultivating a field ankle-deep in water; and an oblique air-photograph of 'the Promised Land' shows the Jordan meandering amid the scrub in its valley between the arid hills of the 'bad lands'. This is hardly fair! Every critic thinks he could improve upon an author's selection of illustrations; but those chosen have two merits at any rate—they are relevant to the text and most of them are unfamiliar. But the vast untapped source of official air-photographs, ideal for a book like this, is hardly used. (The mound of Erbil, of which an air-photograph was published in *ANTIQUITY*, vol. x, 1936, opposite p. 136, would have been a useful inclusion).

We can heartily recommend all readers of *ANTIQUITY* to buy this book. O.G.S.C.

A DESCRIPTION OF ORDNANCE SURVEY LARGE SCALE MAPS. *Published by the Director General at the Ordnance Survey Office, Chessington, Surrey, 1947. Price, 1s 6d.*

THE SAME OF SMALL SCALE MAPS. *Same price.*

The Ordnance Survey of Great Britain differs from the national survey-departments of some other countries in that it does not stagnate. Its Directors are 'always seeking something new, that which they have done but earnest of the things that they shall do'. The reason is to be found, we think, in a fine tradition of public service which goes back unbroken to Mudge, Colby and Roy; and in an awareness of what that service demands. There is here none of that complacency associated abroad with the scale of 1:80,000, for instance.

The outstanding new development today is the National Grid which (coupled with retriangulation, a magnificent achievement in itself) makes possible the production of a uniform series of maps from the 1:2500 to the 1:1,250,000. Archaeologists will chiefly welcome the new intermediate scale of 1:25,000 (2½ inches to the mile) which is ideal for much historical work and adequate even for field-work, though for the latter the 6-inch scale still remains the best. The small scale pamphlet reproduces a portion of the Ordnance Map of Roman Britain; and we understand that both this and the Dark Age

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maps will before long be reprinted and again available, together with some others of the same kind.

It is not the fault of the Ordnance Survey that its maps are nowadays more beautiful than the country they represent. O.G.S.C.

THE ROYAL ART OF ASTROLOGY. By ROBERT EISLER. *Herbert Joseph, London, 1946. 296 pages, illus. 18s.*

This book is an exposure of the ridiculous racket called astrology which has replaced Christianity as the religion or superstition of many uneducated English people, particularly women. The author shows how its 'professors' do not even know the history of their own art, and that their prophecies have been falsified over and over again. On pp. 21-3 is an amusing series of extracts from the lucubrations of some of the newspaper astrologers during 1939 and 1940. (On 21 April 1940, Lyndoe thought that an Allied victory would not be long delayed, and on 19 May Naylor forecast 'better news towards the weekend', during which Belgium surrendered). The factual parts of the book are generally sound, but the author gets out of his depth when he theorizes, as for example in his absurd explanation of the origin of writing and astronomy, based upon the statement of a writer who lived more than two millennia afterwards. This theory is solemnly quoted on the dust-cover as demonstrated fact. He does show, however, that there is no truth in such claims as that of Pearce (1911) that the learned men of the 19th century denied the truth of astrology without taking the trouble to investigate it, being too prejudiced to do so. After quoting by name those who have done so he concludes (p. 28): 'Not one item of the list of their books . . . is ever quoted by any one of the defenders of astrology. They will not acknowledge honestly the decisive fact that their futile practices have been investigated with the greatest care and impartiality by the foremost scholars of the leading western nations for now almost three centuries, and that not one of these has failed to condemn them as the stale, superstitious residue of what was once a great pantheistic religion and a glorious philosophical attempt to understand and rationally to explain the universe, a bold enterprise to which we owe not only the whole of our astronomical knowledge, but the most essential part of all our physical science'.

There are some amusing pictures, including one (on Plate 1) of Mrs Sudbury Hurren and Mr Alexander Ruperti explaining the horoscope of Jesus Christ. O.G.S.C.

NEW ZEALAND ARCHAEOLOGY AND AIR-PHOTOGRAPHY. By G. BLAKE PALMER. A paper read before the 6th Science Congress of the Royal Society of New Zealand, May 1947.

New Zealand would not appear to be a very promising country for archaeological air-photography, for much of it is covered with forest and scrub. It is therefore all the more creditable that an English doctor who has gone there should have been able to discover and publish such excellent results as those illustrated here. The *pa* at Waikaukau (Fig. 6), a rectangular earthwork with remains of habitations visible within it, is well revealed by a good air-photograph taken by the N.Z. Aerial Mapping Company, and so are the associated groups of pits and outlying earthworks. Other air-photos of the lagoons on the shore at Cloudy Bay at the mouth of the Wairau river in Marlborough confirm and amplify the extent of Maori canals 'constructed to facilitate the fixing of eel-weirs and the driving of moulting wild-duck'. Dr Palmer makes certain useful suggestions about the taking by the R.N.Z.A.F. of archaeological air-photographs—a

practice long established in this country. He also advocates the marking of more of the fast vanishing Maori sites on the official maps, and the appointment of an Archaeology Officer, as at the British Ordnance Survey. Needless to say we heartily commend these suggestions to the powers that be there, with the hint that now is the time. *Bis dat qui cito dat.* O.G.S.C.

THE GREAT CHARTULARY OF GLASTONBURY. Edited by DOM AELRED WATKIN. Vol. I: pp. LXXXIX, xviii, 236. Somerset Record Society, Vol. LIX, 1947. Printed for subscribers only.*

The Great Chartulary of Glastonbury is a 14th-century manuscript, written in a single hand and completed *circa* 1340. It has been edited by Dom Aelred Watkin and will be published in two volumes by the Somerset Record Society. The first volume has already appeared, and the second will be eagerly awaited by all who are interested in Glastonbury Abbey.

In Vol. I Dom Aelred Watkin has made easily accessible a carefully edited text of about half of this important chartulary. He warns us of certain defects. It is a pity that the text was not collated with the original documents when these exist. It is a pity that it was not possible to collate the text with the *Secretum Domini* (a copy of the Great Chartulary made for the Abbot of Glastonbury in 1342 and now preserved in the Bodleian Library), but we are assured that no readings of value have been lost by this omission. The editor cannot be blamed for the financial conditions that precluded the publication of the text in its entirety, and it should be noted that he omits or summarizes only what is printed elsewhere or readily lends itself to calendaring (e.g. formal confirmations, final concords, etc.). He always gives references and the reader is never left in doubt. Many would prefer fuller notes, but we cannot complain for the editor's object was to produce 'a careful and accurate text' and to avoid loading it with critical apparatus. Within his carefully defined limits he has done remarkably well. But it would have been better if, instead of inserting his emendations into the text and relegating the manuscript readings to footnotes, he had left the text as it stood and given the emendations as footnotes.

Within the chartulary itself documents are arranged in groups according to their content. The major groups now printed in Vol. I deal with Glastonbury's archidiaconal rights over seven neighbouring churches, appropriated churches, pensionary churches, the relationship between Glastonbury and the Bishop of Bath and Wells (important for the history of the abbey), the patronage of the Priory of Burtle (seven documents which bring together the little that is known of a small and obscure religious house), papal privileges, royal privileges, feudal services owed to the king, royal grants of markets and fairs, royal protections, the liberties of the forest, royal confirmations, knights' fees, Final Concords, and royal inquisitions concerning the origins of the abbey's numerous immunities and rights. Together they present a many-sided picture, legal, economic, historical and topographical, of the development of a great monastic establishment. They illustrate its relations with pope, king, diocesan, and dependents, and they also preserve much information of general importance. They form, in the words of the editor, 'a source-book preliminary to the history of Glastonbury'.

* The reviewer understands that non-members of the Somerset Record Society may become, upon payment of two guineas, 'temporary' members and so receive both volumes of *The Great Chartulary*. Those who wish to take advantage of this concession should communicate with the Honorary Secretary: Rev. Prebendary T. F. Palmer, East Brent, Somerset.

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Instead of an introduction the editor has supplied (pp. xv-LXXXIX) a fairly detailed 'Descriptive Analysis'. This is an excellent feature of the volume. It enables the editor to indicate the correct position of certain misplaced documents, to place others in a logical sequence within their groups, to discuss the significance of the more important documents, and to relate all of them to each other and to their background. This piece of apparatus, skilfully designed and effectively controlled, goes far towards making full textual notes unnecessary. From it the reader who does not wish to plod through the Latin text will quickly obtain a picture of the contents of the chartulary and of the great abbey which owned it. And the scholar also will find it extremely useful.

The second volume will contain that part of the chartulary which deals with Glastonbury estates in detail. From it we may expect much further information, especially topographical information. It is the part of the chartulary that will appeal most to archaeologists, local historians, and students of place-names. There will also be an introduction and an index of all names 'down to the smallest field names'. Dom Aelred Watkin has rendered a great service to scholars. He has also led us to hope that he will some day produce that history of Glastonbury for which he is now preparing the ground.

F. T. WAINWRIGHT.

THE PYRAMIDS OF EGYPT. By I. E. S. EDWARDS. 1947. Pelican Books, pp. 256, 15 plates and 34 line drawings. Price 1s.

A reliable book on Egyptian pyramids by a recognized authority has long been needed, and the appearance of such a book in the Pelican series is particularly welcome in these days of rising costs.

A short introductory chapter provides the necessary historical and religious background to enable the reader to consider the pyramids as an expression of the religious ideas which led to their construction.

The main body of the book (chapters I-VI) is concerned with a description of the development of the pyramid from the archaic mastabas to the degenerate pyramids of the Late Egyptian period. The disadvantage of such a method of treatment, in which 170 pages are used to follow the course of development of the royal tomb, is that the various and inevitable digressions lead to the risk of making it difficult to see the wood for the trees. None the less, the author has skilfully woven into his narrative the various important points, and has made several suggestive observations.

In describing the Step Pyramid complex, he points out (p. 53) that the mortuary temple may have been a stone representation of the royal palace at Memphis. Whereas Zoser had a large stone-built Heb-sed court to the east of his pyramid, the later kings were content with low reliefs of the Heb-sed ceremony, placed on the walls of the upper temple of the pyramid (p. 63). In dealing with the early stone pyramids, emphasis is carefully laid upon the smallness of the blocks used (pp. 63-4); not only did they approximate in size to the mud bricks, but they were often likewise laid in headers and stretchers. The casing blocks were often inclined in order to minimize the labour involved in trimming them *in situ* (p. 69). The evidence he adduces to show that the Maidum pyramid of Snefru was never completed tends to receive confirmation (if any were needed) from the recent excavation of Snefru's double-angled pyramid at Dahshur, the details of which affect the remarks on pp. 83-84 and 239-240 of Mr Edwards' book, which was too far advanced to include more than a postscript relating to this excavation. It is likely that Snefru built three pyramids—that at Maidum and both the stone pyramids at Dahshur, as Alexandre Varille has recently suggested (*A propos des Pyramides de Snefrou*, Cairo, October 1947).

Comparison with the Dahshur pyramids suggests that the horizontal passage leading south from the lower chamber of the pyramid of Kheops was intended to lead to another chamber which was never cut (p. 89). Mr Edwards emphasizes the probable rôle of the Sphinx as a representation of Khephren in the form of the Sun-god acting as the guardian of the Giza necropolis (p. 107). His account of the Opening of the Mouth ceremony before the statues in the funerary temples is illuminating (p. 111), as are also his remarks on the duties of the pyramid priesthoods and the privileges enjoyed by them (pp. 124, 146). The author has made extensive use of his study of the reliefs on the walls of the causeways and funerary temples, and by their aid has gone a long way towards interpreting the functions of the pyramid complex (see especially pp. 158-161).

A word may be said as to the author's terminology of the pyramid temples. He follows normal usage in referring to the temples adjoining pyramids as Mortuary Temples, and he refers to the structures at the lower end of the causeways as Valley Buildings. The valley structure of Mycerinus seems definitely to have served as a funerary temple, as statues, stone vessels, and implements for use in the Opening of the Mouth ceremony were found therein. The temple adjoining the pyramid of Mernere seems to have been called *šspt hrt* = the upper room or temple, in the contemporary text of Uni (line 41), and in view of this there seems no reason why these two types of building should not be called the Upper and Lower Temples. As time went on the Upper Temples seem to have grown in importance at the expense of the Lower Temples, hardly any traces of which have yet been found at Middle Kingdom pyramid sites.

In a final chapter, on the construction and purpose of the pyramids, Mr Edwards throws a good deal of light on how they were built. He describes, *inter alia*, the factors which governed the choice of a site; how the levelling of the pyramid area may have been assisted by flooding; and how the four sides were oriented to face the cardinal points. He makes (p. 227) the valuable suggestion that the first course of casing may have been laid before the pyramid core, in order to define the size and orientation of the structure. After describing the methods of quarrying limestone and granite he deals with the means of transporting the blocks to the sites of the pyramids. There can be little doubt that the granite from Aswan was transported downstream during the inundation period when the boats were less likely to run aground. The existence of built causeways for facilitating transport of the stone from the quarries to the Nile might have been stressed. The main problem, how were the stones lifted to form the various courses of masonry, remains essentially unsolved. That some kind of construction ramps of mud-brick were used is clear, but the exact form of those construction ramps remains in doubt. The two lines of masonry extending south-west of the north stone pyramid of Dahshur are, in the reviewer's opinion, the remains of limestone causeways from a local limestone quarry. If they were remains of brick construction ramps, as Mr Edwards suggests (p. 221), they would show much darker on air photographs. He rightly insists that, with the possible exception of the lowest course, the casing stones were dressed after being placed in position, despite Petrie's arguments to the contrary (pp. 225-7).

The author's final pages on the symbolic meaning of pyramids, based partly on a comparative study of the ancient Egyptian words for 'to ascend' and 'pyramid', are valuable. There can, it seems, be little doubt that the original stepped form of pyramid symbolized the deceased king's stairway to the sky, referred to in the Pyramid Texts.

The line-drawings by J. Cruikshank Rose are excellent, but one rather wishes the plans were accompanied by scales. The photographs include various statues of pyramid builders, and an excellent oblique aerial view of the pyramids of Giza. In short, the author is to be congratulated on a fine piece of work.

L. V. GRINSELL.

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EARLY INDIAN PAINTED POTTERY. By D. H. GORDON. *Journ. Indian Soc. Oriental Art*, XIII (1945), 35.

In this study Col. Gordon draws attention to the danger of thinking in terms of a 'Painted Pottery Period' in Indian prehistory, since the technique of pottery painting has lasted little changed in Northwest India until the present day. Such an idea has long been exploded in Europe, and would hardly be held by reputable Oriental scholars even in India, but the warning may be valuable to the amateur. Gordon refers to the late Brig. Ross's invaluable work at Rana Ghundai (now published in *Journ. Near Eastern Studies* v (1946), 284-316), but seems to under-rate the Buff Ware and Red Ware grouping of Iranian prehistoric wares and their Indian counterparts—a broad distinction which we owe to McCown and which seems to the reviewer only not the only reasonable basis for classification, but one which really does make sense in the light of increasing knowledge from India. The comparisons between Hissar I and Rana Ghundai II have been considerably strengthened by the new material published by Ross, and the 'archaistic' wares of Bampur and Khurab cited by Gordon in this connexion are not really relevant, their affinities being with those of Shahi-tump, a site which can hardly be earlier than Akkadian. For the Nineveh v—Tell Billah chalices with animal friezes quoted by Gordon, McCown's remarks should be noted (*Comparative Stratigraphy of Early Iran* (1942), p. 48, note 88).

The survival of painted pottery traditions in Western India is a matter of great interest: at Ahichchhatra the fine black-on-grey painted wares seem likely to be 4th century B.C., and Sassanian textile patterns were copied in the 6th-7th centuries A.D. by pot-painters in the Quetta region, which gives an approximate dating-point in an otherwise rather vaguely 'post-prehistoric' series. But after all, in Sind, as the late Ernest Mackay pointed out, pottery painted with good Harappa Culture designs was being made a few years ago, so we may have to be more than usually chary about making chronological equations in a country so conservative as India. STUART PIGGOTT.

ALEXANDER THE GREAT. By W. W. TARN. *Cambridge University Press*, 1948; 2 vols., 'Narrative', pp. xi+161, with a Map, 10s 6d; and 'Sources and Studies', pp. xiii+477, with a Map, 30s.

If it be true that the great deserve and indeed require to live afresh by the pen of each successive age, then Alexander above all requires it, for every age so far, since the study of Greek history was reborn with Niebuhr, has had not its own Alexander but its Alexanders. Dr Tarn in his chapters in the *Cambridge Ancient History* (vol. VI, 1927) had re-created what was to many perhaps the most satisfying Alexander hitherto, and now in these two volumes he both gives his latest thoughts on the subject and explains, far more intimately even than Beloch ever explained to his readers, just why it seems to him that Alexander was like this, rather than like that, or like the other.

The 'Narrative' might appear to the casual reader almost identical with the text of the chapters in the *Cambridge Ancient History*, but in fact it contains a large number of changes mostly small if reckoned by a count of words or phrases, but often really important. Thus though Dr Tarn's 'general view of Alexander remains unchanged' (Preface), his views are amplified, modified, or occasionally even reversed on such important matters as the status of the liberated Greek cities in Asia Minor (pp. 31 ff.), the battles of Gaugamela (pp. 46 ff.) and the Hydaspes (p. 95—where the new sentence inserted in the text at ll. 18-23 must surely be the most illuminating remark yet made about this battle by any writer ancient or modern), Callisthenes and the 'Son of Zeus' legend (p. 78), the

' new army ' of the far-eastern and Indian campaigns (pp. 82 ff. and 92 f.), the celebrated banquet at Opis (pp. 116 and 147), the alleged plans for world conquest (pp. 121 f.), the satrapal system in the empire (p. 127), the Alexandrias and the new city-foundations in general (pp. 127, 133, 136), Cleomenes in Egypt (pp. 129 f.), the policy of race fusion (p. 137). Those are the most important topics of which Dr Tarn finds something new to say: and the most important of these in their turn are the subject of essays in the volume entitled ' Sources and Studies '.

For our knowledge of the thirteen years of Alexander's reign we owe surprisingly little to the archaeologist, though a few important inscriptions and very many coins have been preserved and interpreted. Nor is it likely that archaeology in the future will be able to add more than here and there some useful detail to the picture—as for example (we may hope) from excavations such as those now or recently in progress on the site of Alexandria of the Caucasus (as the Greeks called the Hindu Kush). But for the greatest truths about these years so decisive in human history we must always rely mainly on a literary tradition of an almost unparalleled variety (in so small a compass), and it is by what he makes of this tradition that every historian of Alexander will ultimately stand or fall. Dr Tarn has lived with his sources for a good many years now, and knows them in a way which puts even some good historians to shame, and had ones to the blush. His work here in ' Sources and Studies ', especially Part One (the so-called ' Vulgate ' and its sources) and Appendices 15, 16, 17, 22, 23 and 24, represents incomparably the greatest achievement in this field up to this time, and in particular his revaluation of Cleitarchus and Aristobulus, though it is sure to be contested, will be found ultimately, I am convinced, to have placed the study of Alexander on a sounder basis than ever before.

Students of the Hellenistic world owe very much already to Dr Tarn, and this splendid book greatly increases their debt.

G. T. GRIFFITH.

VERGIL'S LATIUM. By BERTHA TILLY, PH.D., M.A. (Lond.). pp. xv, 123 with 36 photographic plates and 8 maps or plans; Basil Blackwell, Oxford, 1947. 15s. net.

Dr Tilly's topographical study of the Roman Campagna is a companion volume to the last six books of the Aeneid. In it she describes the Campagna as it is today, or as it was when her researches were carried out in the years between 1933 and 1939, for the area lay in the track of the allied armies in their advance on Rome from the Anzio beach-head, and some of the remains which she illustrates may have suffered damage or destruction. Dr Tilly gathers historical, archaeological and topographical material in an attempt to reconstruct the area as it was in Vergil's day and to relate the epic narrative to the actual countryside in which it is set.

Dr Tilly observes that ' archaeology does not confirm the tradition that either Ardea or Lavinium was an inhabited site in Trojan times, or that they could, in reality, have played any part in the Aeneas-legend '. Nevertheless the study of the ancient places, already in Vergil's own day a decaying region, which he chose for the scene of the great climax of his poem, has had a fascination for scholars, and Dr Tilly follows in the footsteps of a number of distinguished predecessors in the task of reconstructing them as Vergil knew them. ' Totius Italiae curiosissimum fuisse Vergilium multifariam apparet ', says Servius in a comment, which the author quotes on her title page, and scraps of information on local cults or local history may often throw light on Vergil's thought. Thus Strabo's record of a temple sacred to Venus near Ardea, where the Latins held federal cults, and ceremonies were observed said to date back to the time

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of Aeneas, may well supply the link between the religious importance of the city as a cult centre and its prominence in Vergil's narrative. Dr Tilly has an interesting chapter on the vexed question of Vergil's Laurentum, for which she proposes a new location, rejecting the theory of Dessau and Carcopino, accepted by many scholars, 'that Lavinium alone existed and bore the name of Laurentum until she was founded for a second time by Aeneas, when he married Lavinia and took over the government from Latinus'.

Under the title 'The Trojan landing and Troia Nova' the author discusses Ostia in Vergil's day in the light of modern investigations both of the city itself and of the considerable physical changes in the area of the Tiber's mouth, and suggests reasons for the abandonment by Vergil of the earlier tradition that Aeneas landed at a point further south. Other chapters deal with topographical problems connected with the river Numicus, the oracle of Faunus at Albunea, and the ager Solonius. The book is a useful introduction to this aspect of Vergilian studies and contains much that is of interest and value. Some blemishes may be noted. The illustrations from Dr Tilly's own photographs are plentiful and mostly good, but are often remote from the corresponding text and sometimes inadequately described, e.g. 'Ostia' might be added on plates 9-12. Either the map on page 5 or its title is upside down. In the first line of the quotation from Vergil (Aen. VII, 109-11) on page 26 the omission of -que destroys the scansion, and in the passage from Ovid (Met. XIV, 573-7) the misprinted text 'congeriet media' for 'congerie e media' mars the sense and the grammar. On page 65 by beginning her quotation from Lucan in the middle of a sentence and omitting a comma after 'penates' Dr Tilly obscures the sense and the syntax. In compensation the insertion of a comma after 'fines' in the second line of the quotation at the head of chapter VII (Aen. XI, 316-21) has the same effect. To say, as the author does in footnote 4, page 44, that 'Vergil's words in Aen. VII, 412, "dictus avis" might be taken to mean "called (by the name of) a bird"' revives an old and highly fanciful view and ignores the quantity. The carelessly worded statement on page 3 that 'for Vergil, however, the Trojans first come to land in Italy on the banks of the Tiber' might suggest that the author had forgotten the famous opening of Book VI. In spite of such minor lapses the book may be recommended as a very useful supplement to purely verbal commentaries on Vergil's text.

G.F.F.

Correspondence

Sir,

I recently attended the 29th International Congress of Americanists in New York, during which I heard some information of interest in connexion with your Editorial Notes and my review-article 'Peru before Pizarro' in your September issue.

When I first heard of it earlier in the year I hoped that radiocarbon might at last provide us with some reliable dates for South American archaeology, and the Congress proved that American archaeologists are fully alive to this possibility. We had the privilege of hearing a lecture by Dr Libby on radiocarbon dating, and he has applied the method to some wood collected by Junius Bird at the base of the Cupisnique horizon in Peru. The figure he got was about 800 B.C. with a possible error of 200 years either way. He was very cautious about giving figures at this stage, but he felt that the result he got here was reliable enough to quote. Readers of my article will recall that the date falls well enough between Bird's estimate of 1800 B.C. and previous guesses of about A.D. I.

I am, Sir, your obedient servant

G. H. S. BUSHNELL, *Curator*

University Museum of Archaeology and Ethnology, Cambridge

5 November, 1949

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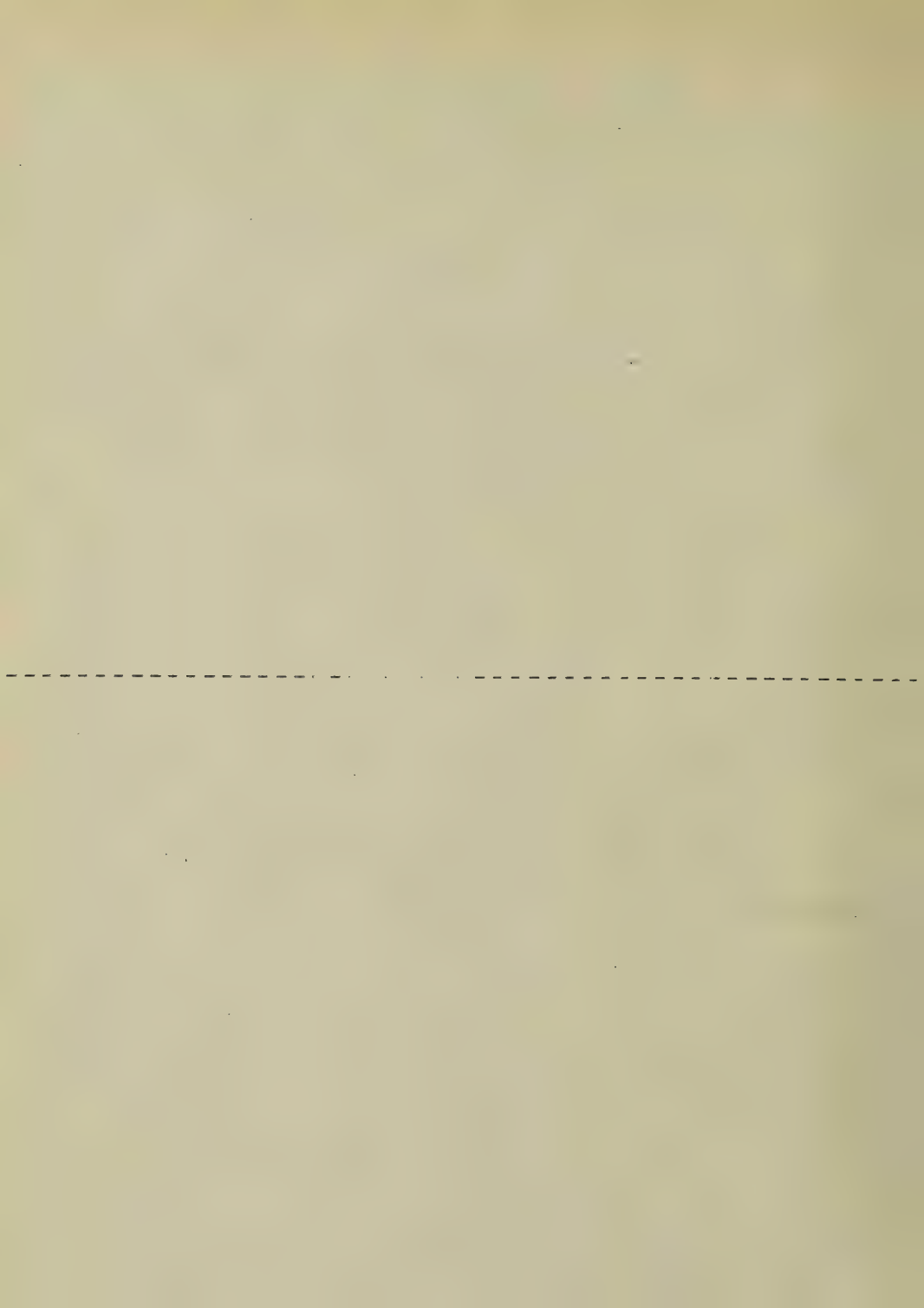
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